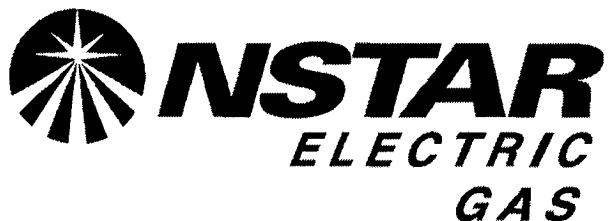


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2004 Operating Study of the
NSTAR-North Transmission System

Prepared For

The Commonwealth of Massachusetts
Department of Telecommunications & Energy

**Thermal Analysis Studies
To Assess the Performance of the
NSTAR-North 345kV & 115kV Transmission Systems
Under Normal & Contingency Conditions
At Extreme Summer Peak Load Levels.
2004 - 2008**

April 1, 2004

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1. EXECUTIVE SUMMARY

1.1 Scope

The focus of this study is to assess the capability of the NSTAR-North transmission system to serve extreme summer peak loads in 2004 through 2008 under normal and contingency conditions and minimum levels of local generation. NEPOOL and NSTAR peaks are modeled coincident with each other. Each base case has one of the major generation blocks at Mystic Station out of service to stress the cases prior to application of the contingency outages. The goal is to elucidate deficiencies in system performance that are present now and that will surface in the future if upgrades to the transmission system are not implemented. Although current speculation is that the Salem Harbor units will be retired somewhere in the 2004-08 time frame, Units 1,2,3 (302MW total) were dispatched in all of the cases. Their presence had no significant impact on the study area; they were dispatched only to avoid exceeding area import capabilities. The minimum amount of generation that was necessary to bring Boston import lines within LTE ratings was dispatched. The element that primarily required this relief was Line 148-522XY from West Walpole to Needham. Salem Unit 4 was not dispatched in any of the cases.

Single (N-1) contingencies (stuck breaker or loss of single line element) were tested to assess the thermal capability and voltage performance of the system. Several approaches to relieve overloaded elements and improve voltage profiles in the NSTAR-North 115kV system have been developed and evaluated in other NSTAR studies. These focused primarily on the addition of static reactive support (shunt capacitor banks) to improve voltage profiles and thereby reduce line and transformer loadings.

The most limiting 115kV contingency in the Downtown area was loss of either Line 385-510 or 385-511. This is not a problem under peak load conditions through 2006 if New Boston is available when Mystic Block 9 is out of service. These parallel underground cables travel between Kingston Street 115kV and K-Street 115kV. Two network stations (Kingston and High Street) are tapped of these lines. Each line supplies two step-down transformers at each station (four transformers each).

The most limiting 345kV contingency was loss of either Kingston Autotransformer or loss of either of the two lines (324 and 372) that supply them. Lines 324 and 372 are parallel 345kV, HPOF, underground cables that connect Mystic Station in Everett to Kingston Street Station in downtown Boston. Again, these contingencies do not result in LTE or voltage violations when New Boston is available or once the 345kV reinforcements are in place.

Internal NSTAR studies of the Downtown Boston transmission system indicate that the thermal and voltage performance of all voltage levels in the system is significantly improved once the 345kV cables from Holbrook to K-Street are in-service. All of the import line flows are significantly reduced, and the downtown system is considerably better balanced. No thermal or voltage violations are present at the 2008 extreme load level with the 345kV in-service under all-lines-in or contingency conditions.

1.2 Conclusions

The results of this study indicate that the NSTAR-North transmission system can survive through 2006 with Block 9 off and New Boston available, but system performance deteriorates sharply after that. Voltage profiles in 2008 are still within limits with all lines in, but many buses experience low voltages during contingencies, even with New Boston in service. This is especially true for the double-circuit tower (DCT) contingencies. Specifically, this means that the system can operate within established NEPOOL thermal and voltage limits under all-lines-in and contingency conditions as long as the upgrades recommended here are implemented as suggested. Many system elements are operating very close to their thermal limits under contingency conditions, and some are loaded close to their continuous limits with all lines in.

The situation with voltage performance is similar: the system is operating close to acceptable operating limits. Unavailability of dynamic reactive resources like New Boston and Mystic Block 9 raises concerns relative to voltage performance of the system. Static reactive compensation has been modeled in this evaluation per the recommendations of other NSTAR studies of the downtown Boston system.

New Boston provides the necessary injection of MW and MVar at the correct point to balance the strong 345kV autotransformer sources at Mystic and at Kingston Street. This reduces loading on the interconnecting 115kV lines because tapped loads can be supplied more equally from both sides. It is important both as a MW source and as a MVar source. Without some sort of injection into the K-Street area, network stations tapped along the lines are primarily supplied from Kingston Street, and the line sections closest to it become heavily loaded relative to the line sections at the K-Street end. Supply to Kingston Network and High Street becomes almost radial from Kingston Street as the K-Street end contributes little to the load demands of the tapped network stations. The problem is severe enough that loss of either Line 385-510 or 385-511 becomes the most limiting contingency in 2004 absent availability of the New Boston unit.

1.3 Capacitor Application Recommendations From Prior Studies

The reactive loading on the downtown system results in thermal and voltage violations throughout the 115kV and 14.4kV systems in downtown Boston and the surrounding areas beginning in 2004 and increasing each year thereafter. Recent operating experience indicates that 14kV and 115kV voltage regulation is marginal in certain areas of the system at current peak load levels. The significant increase in reactive demand predicted by the extreme weather forecasts for 2004-2008 results in L.T.E. violations of line and transformer ratings, primarily for outages of parallel elements. Numerous voltage violations are also present. Without additional capacitors, voltages in the Downtown 115kV system are in the 0.92pu range with Mystic 9 out of service and all lines in. N-2 contingencies of 115kV lines or transformers reduce voltages into the 0.90pu range. On-load tap changers on step-down transformers are at their maximum boost positions during many of the 2004 contingencies and even with all lines in service by 2006. Uncompensated 14kV bus voltages, however, still fall into the 0.85pu range. Reactive losses through the transformers are prohibitively high, as they increase with the square of the current.

In order for the downtown system to serve load and survive coincident generation and element contingencies without New Boston and/or Mystic Block 9, the reactive support formerly available from the generators has to be replaced, and additional support needs to be provided to cover the increased load requirements modeled in each yearly case. Switched, shunt capacitor banks applied at the 14.4kV and 115kV levels beginning in 2005 would be needed to allow the system to operate within accepted voltage limits under all lines in and contingency conditions, even with no 115kV generation in the downtown Boston area. Some of the banks would be pole-top units on distribution feeder circuits while others will be 14kV and 115kV station banks. The 115kV station banks would be rated 53.6MVAR and will require bifurcation with an existing circuit in most cases due to unavailability of 115kV breaker positions. The system is near its import and infrastructure limits again by 2006, however, so a more permanent solution to reinforce the K-Street area needs to be implemented by that time. Table 1-1 tabulates the proposed and existing capacitor banks in the NSTAR-North system that were modeled in this study.

The minimum amount of capacitors have been allocated that would eliminate voltage and thermal violations without causing problems with light load voltage control for the case with both New Boston and Mystic 9 unavailable. Too many capacitor banks could prove difficult to operate and manage, especially with the voltage control challenges brought about by load variations and the magnitude of capacitive charging associated with the 115kV and 345kV cable systems. Although the results indicate performance that is close to established limits, it should be noted that the load models employed here represent extreme weather loads that have only a 10% probability of occurring and then only for a few days at a time.

Location	Existing Cap Banks	Additional Cap Banks	Year Required	Reason (Voltage Support is Common To All Banks.)	Total Cap Banks
Kingston A 14.4	None	5 x 5.4MVar	2005	385-510/511, 324/372 and Kingston 345A/345B Contingencies.	4 x 5.4MVar
Kingston B 14.4	None	5 x 5.4MVar	2005	Kingston 345A/345B Contingencies.	4 x 5.4MVar
Colburn A 14.4 (New Station)	None	2 x 9.6MVar	2005	324/372 and Kingston 345A/345B Contingencies. (Pre-Planned For New Substation)	2 x 9.6MVar
Maynard A 14.4	None	5 x 5.4MVar	2005	282-507 (Leaves Maynard Radially Supplied From Framingham.	2 x 9.9MVar
Maynard B 14.4	None	5 x 5.4MVar	2005	Kingston 345A/345B Contingencies Supplied From Framingham.	4 x 5.4MVar
Carver A 14.4	None	5 x 5.4MVar	2005	324/372 and Kingston 345A/345B Contingencies Supplied From Framingham.	4 x 5.4MVar
Carver B 14.4	None	5 x 5.4MVar	2005	Kingston 345A/345B Contingencies Supplied From Framingham.	4 x 5.4MVar
Andrew Sq A 14.4	2 x 9.9MVar	None	N/A	N/A	2 X 9.9MVar
Andrew Sq A 14.4	2 x 9.9MVar	None	N/A	N/A	2 X 9.9MVar
K-Street 385-D (New Station)	None	4 x 9.6MVar	Pre-Planned For 2004	324/372 and Kingston 345A/345B Contingencies. (Pre-Planned For New Substation)	4 x 9.6MVar
Framingham 115	1 x 63MVar	1 x 63MVar	2005	Voltage Support in West	2 x 63MVar
Dewar St A 115	None	1 x 63MVar	2005	Kingston St 345A/345B and 324/372 Contingencies.	1 x 63MVar
Dewar St B 115	None	1 x 63MVar	2006	Also 385/510/511 Contingency.	1 x 63MVar
K-Street 1 115	1 x 63MVar	None	N/A	N/A	1 x 63MVar
K-Street 2 115	1 x 63MVar	None	N/A	N/A	1 x 63MVar
Dover 115	1 x 63MVar	None	N/A	N/A	1 x 63MVar
Baker Street	2 x 63MVar	1 x 63MVar	2006	148-522XY Loading and 110-522/240-510 DCT. Voltage Violations.	3 x 63MVar
Sudbury	None	1 x 63MVar	2006	Local Voltage Support	1 x 63MVar

NOTE: NSTAR Standard Transmission Capacitor Bank is rated 63MVAR, 124.7kV. Output at 115kV ~ 53.6MVAR.

Table 1-1. Existing Shunt Capacitors & Recommended Capacitors If New Boston Is Retired.

2. STUDY METHODOLOGY

The study models the existing NEPOOL and NSTAR transmission systems at extreme summer peak load levels predicted for 2004 through 2008. The NEPOOL and NSTAR-North load data for each of the five years is presented in Appendix A. NSTAR-North loads were applied at the 14kV substation buses in accordance with NSTAR's internal load forecast for 2004 through 2008. The NSTAR loads were applied first in the loadflow models, and then the remainder of the NEPOOL load was scaled upward until the total system load (plus losses) was approximately equal to the 90/10 NEPOOL forecast.

Interface transfers were set per current NEPOOL Transmission Task Force guidelines. The most significant interface in this evaluation is Boston Import, which was in a heavy import condition in all cases due to the absence of local generation in each case, as well as the annual increase in load level. Other transfers were adjusted through generation dispatch, with some fine-tuning achieved by minor load adjustments in selected pockets outside the NSTAR-North system. NSTAR-North loads were not adjusted in this process; hence, changes in the Boston Import level are the result of generation changes only. A list of key interface transfers for each case is presented on the front pages of Appendices A3-1 through A2-3.

The base cases were set up so that no lines or transformers within the NEMA/Boston Import Interface exceeded normal ratings with all lines in. This required dispatch of a combination of Salem Harbor Units 1,2,3, but Unit 4 was not required. Normal conditions with all lines in and the contingency outages listed in Appendix B were tested and evaluated. All facilities loaded above 95% of their continuous ratings under normal conditions and above 95% of their LTE ratings during contingencies were reported. All contingencies were applied under typical stressed conditions in the NSTAR transmission system as well as the import lines supplying the NEMA/Boston area.

Base Voltage (kV)	Post-Contingency Bus Voltage Criteria		
	Lower Limit (pu)	Upper Limit (pu)	Voltage Deviation
115kV and Above	0.95	1.05	5%
Below 115kV	0.90	1.10	10%

Table 2-1. Voltage Acceptability Criteria Applied in Study

Thermal Rating Criteria		
System Condition	Rating Duration	Applicable Rating
All Lines In	Continuous	Normal
Post-Contingency	15 Minutes	Short Term Emergency (STE)
	4 Hours	Winter Long Term Emergency (LTE)
	12 Hours	Summer Long Term Emergency (LTE)

Table 2-2. Thermal Rating Categories Utilized in Study

3. CASES USED FOR THERMAL ANALYSES

3.1 Overview

Cases representing 2004 - 2008 extreme weather NEPOOL and NSTAR summer peak loads with coincident peaks were modeled in this study. They were developed from the 2005 cases in the 2000 NEPOOL Library. NSTAR-North loads, generated from NSTAR extreme weather forecasts, were applied first in the loadflow models, and then the rest of NEPOOL was scaled to match the loads in the 2003 C.E.L.T. report. A copy the normal and extreme summer load forecasts from that document are presented in Appendix A. The loads modeled for NSTAR-North are also presented there. Tables 3-1 and 3-2 on the following pages present brief summaries of local loads, generation, and interface transfers that provide a quick overview of the local system conditions that were modeled. These tables are also illustrated on the front page of Appendices B-1 and B-2. The base assumptions for system topology and dispatch that are valid for all of the cases are presented in Section 4. Items such as tie breaker status, upgrades modeled, elements in/out of service, generator retirements, and reactive compensation are included.

A wider and more detailed view of the system conditions that were modeled is provided in the Appendices. Appendix B contains the loadflow summary sheets for each case. These are two page documents that contain detailed, yet concise information for all of NEPOOL. They tabulate the outputs and terminal voltages of major generators, magnitudes of key interface transfers, and transmission bus voltages throughout New England. Combined with the loadflow diagrams in Appendix E, a complete overview of local and area conditions is provided at a glance. These tabular and graphical outputs help to understand the results obtained from the loadflow analyses.

	2004	2005	2006	2007	2008					
NEPOOL Load	26,659	26,961	27,333	27,788	28,183					
NEPOOL Losses	747	752	772	820	839					
NEPOOL Load + Losses	27,406	27,713	28,105	28,608	29,022					
NSTAR-North MW	4,055	4,099	4,207	4,291	4,366					
NSTAR-North MVAr	1,349	1,363	1,401	1,429	1,454					
NSTAR-North MVA	4,274	4,320	4,434	4,523	4,602					
Boston Import (MW)	3,591	3,675	3,819	3,941	4,042					
North-South (MW)	2,599	2,618	2,597	2,894	2,865					
East-West (MW)	2,382	2,404	2,393	2,403	2,400					
SEMA/RI Export (MW)	2,725	2,808	2,975	2,791	2,936					
	MW	MX	MW	MX	MW	MX	MW	MX	MW	MX
Mystic Units 4,5,6	0	0	0	0	0	0	0	0	0	0
Mystic Unit 7	565	149	565	109	565	114	565	161	565	211
Mystic Block 8	706	448	706	328	706	343	706	482	706	622
Mystic Block 9	0	0	0	0	0	0	0	0	0	0
New Boston	0	0	0	0	0	0	0	0	0	0
Kendall CT 4	187	37	187	30	187	29	187	-10	187	43
Salem Harbor	302	111	302	111	302	111	302	111	302	111

Table 3-1. Case Summaries: Block 9 & New Boston Off.

	2004	2005	2006	2007	2008					
NEPOOL Load	26,659	26,961	27,320	27,788	28,183					
NEPOOL Losses	735	741	761	809	825					
NEPOOL Load + Losses	27,394	27,702	28,081	28,597	29,008					
NSTAR-North MW	4,055	4,099	4,207	4,291	4,366					
NSTAR-North MVar	1,349	1,363	1,401	1,429	1,454					
NSTAR-North MVA	4,274	4,320	4,434	4,523	4,602					
Boston Import (MW)	3,234	3,317	3,477	3,582	3,682					
North-South (MW)	2,591	2,610	2,588	2,889	2,857					
East-West (MW)	2,395	2,417	2,420	2,416	2,416					
SEMA/RI Export (MW)	2,381	2,464	2,659	2,446	2,592					
	MW	MX	MW	MX	MW	MX	MW	MX	MW	MX
Mystic Units 4,5,6	0	0	0	0	0	0	0	0	0	0
Mystic Unit 7	565	109	565	73	565	90	565	138	565	130
Mystic Block 8	706	326	706	218	706	271	706	413	706	391
Mystic Block 9	0	0	0	0	0	0	0	0	0	0
New Boston	350	36	350	-46	350	-46	350	-46	350	220
Kendall CT 4	187	32	187	-68	187	-52	187	-14	187	-42
Salem Harbor	302	111	302	111	302	111	302	111	302	111

Table 3-2. Case Summaries: Block 9 Off, New Boston On.

4. BASE STUDY ASSUMPTIONS FOR LOCAL AREA

The status of the elements below applies to all of the cases in this report:

4.1 Generation Dispatches Common To All Cases

- a) Mystic 115kV Units 4,5,6 Out of Service (Retired).
- b) Salem Harbor Unit #4 Out of Service.
- c) New Boston Retired (Except in Case 2 With Block 9 Off)
- d) UAE-Tewksbury and UAE-Lowell Not Represented.
- e) Salem Units 1,2,3 in-service to stay within area import limitations.
- f) Mystic Unit #7 (565MW) In-Service.
- g) Kendall 115kV Unit #4 In-Service at 187MW.
- h) Kendall 13.8kV Units 1,2,3 (63MW) and Jet #1 (20MW) In-Service.
- i) Exelon-Fore River In Service at Full Output.
- j) RESCO-Saugus In-Service at 33MW.
- k) GE-Lynn In-Service To Supply Its Own Load.
- l) L-Street Jet In-Service at 10MW.
- m) MBTA In-Service at 25MW.
- n) Framingham Jets 1,2,3 In-Service at 35MW.

4.2 Transformers

- a) North Cambridge Autotransformer Taps Modeled at 0.96
- b) Kingston Street Autotransformer Taps Modeled at 0.96
- c) New Mystic 345A Autotransformer (300MVA L.T.E.) In-Service.
- d) New Framingham 230A Autotransformer (550MVA L.T.E.) In-Service
- e) Third Waltham Phase Angle-Regulating Transformer In-Service.

4.3 Substations

- a) New Colburn Street Station In-Service in 2005.
- b) New K-Street Station In-Service Supplied From K-Street 115kV Bus (tie is closed).
- c) East Boston Substation Not Represented.
- d) East Cambridge Substation Not Represented.
- e) Additional Transformer 110B In-Service At Dover.
- f) Needham Station #148 Reconfigured With Ring Bus To Sectionalize Line 240-510.

4.4 Tie Breakers

- a) K-Street 115kV tie breaker #22 closed.
- b) Mystic 115kV GCB #7 tie breaker open.
- c) Kingston Street 115kV tie breaker closed.
- d) Chatham Street 115kV circuit switchers closed.

4.5 Circuits

- a) All 345kV Cables In-Service (324, 372, 351, 358, 346, 365, 349XY)
- b) 148-522 Rated 350MVA L.T.E.
- c) 385-510/511 Between Kingston Street and Kingston Network Rated 350MVA LTE.

4.6 Reactive Compensation

- a) 14.4kV Shunt Capacitors
 - 4 x 9.9MVAR, 14.4kV Station Caps At New K-Street Station #385D. (post-2004)
 - 2 x 9.9MVAR, 14.4kV Station Caps At New Colburn St. Station #350. (post-2004)
 - 4 x 9.9MVAR, 14.4kV Station Caps At High Street Station #53. (post-2004)
 - 4 x 9.9MVAR, 14.4kV Station Caps At Andrew Square Station #106.
 - 1 x 5.4MVAR, 14.4kV Station Caps At Lexington Station #320.
- b) 115kV Shunt Capacitors
 - 1 x 53.6MVAR at Mystic Station #250
 - 1 x 53.6MVAR at K-Street Station #385 Bus #1
 - 1 x 53.6MVAR at K-Street Station #385 Bus #2
 - 1 x 53.6MVAR at Framingham Station #240 (post 2004)
 - 1 x 53.6MVAR at Dover Station #456
 - 1 x 53.6MVAR at Lexington Station #320
 - 3 x 53.6MVAR at Baker Street #110 (post 2004)
- c) 115kV Shunt Reactors
 - No Reactors In-Service

4.7 Series Reactors

- a) 2.0Ω series reactors permanently installed on 115kV Lines 329-530 and 329-531.
- b) 2.75Ω series reactor permanently installed on 115kV Line 211-514.

5. STUDY RESULTS

5.1 Explanation of Tabular Results

The results of the loadflow studies conducted for all years at two different local generation dispatches are tabulated in Appendix D. The case ID's and descriptions only reflect the element whose status is different from or not defined in the base case assumptions of Section 5. The subsets of Appendix E contain the thermal and voltage results for each generation scenario as follows:

- Appendix D-1: Base Local Dispatch With Mystic 115kV Block 9 Off., no New Boston
- Appendix D-2: Base Local Dispatch With Mystic 115kV Block 9 Off, New Boston On.

Each sub-Appendix contains two tables. The first is a table of system elements that exceed 95% of their continuous (Rate A) or LTE (Rate B) ratings during normal or contingency conditions, respectively. The tables are sorted by circuit element first, then by contingency. The results for each year are contained in the five columns. Sorted in that fashion, one can immediately see the rating violations for all contingencies that overload a particular element. Two values of loading are given for elements that exceed the 95% limit during contingencies; the top value is the percent of rating before the contingency, and the lower value is the percent loading after the contingency. Without the pre-contingency loading to compare to, it would be difficult to assess the actual impact that a contingency has on an element that shows up overloaded in the results.

The system voltage performance for the cases with Mystic Blok 9 off and no other reactive resources available are highly problematic prior to the introduction of the 345 kV project. This leads to the need for inclusion of additional reactive compensation to help mitigate unavailability of these resources. Many of the entries in the thermal results tables are blank, especially in 2005 and in years after 2006. The lack of data in the 2005 columns reflects the installation of five, new 53.6MVA_r capacitor banks to the 115kV system and three 14.4kV banks of approximately 20MVA_r each to the 14.4kV system. The 2004 case has only 75MVA_r of new, pole-top capacitors modeled on the feeders from Newton, Hyde Park, and Dewar Street. The step installation of this magnitude of static reactive support is sufficient to elevate voltages and reduce line loadings so that many violations are eliminated in 2005. In some instances, this is sufficient to eliminate thermal violations for the duration of the study period. As load continues to grow, however, violations begin to surface again. Re-emergence of contingencies in these cases typically occurs about 2-3 years later if New Boston is maintained in service, but by 2006 the relief that it added to the system in 2004-2006 is almost exhausted. This is especially apparent from the 115kV voltage profiles.

Other instances where blank cell entries are present, especially in later years, are for the Double-Circuit Tower (DCT) contingencies that remove two lines that are mounted on the same set of towers. Any time that two circuits are removed in a single contingency, the overloads on other elements can be substantial, but several of the DCT contingencies in the NSTAR-North system are particularly severe, as they impact the import lines into the greater Boston area. Some of these contingencies are so severe that they could conceivably result in voltage collapse in extreme instances. Such scenarios manifest themselves in the loadflow analysis by failing to converge to a solution. No results are obtained unless the cases are solved within tolerances, and this is believed to be the cause of many of the blank entries for DCT and other difficult contingencies, especially at load levels in 2006 and beyond.

5.2 Explanation of Loadflow Diagrams

The diagrams in Appendices E and F illustrate system flows and voltages for all case years under normal and contingency conditions, respectively. All line flows are identified with the actual MVA flow printed on top of the line and the % of continuous or L.T.E. current rating below the line. Generators have the MW output on the top line and the MVAr output on the bottom line. The actual MVA delivered to the system is available by examining the flow through the step-up transformer. MVA is on the top and the percent of Ampere rating is on the bottom. Outaged elements are depicted with a short-dashed line with no powerflow values printed. Overloaded elements are depicted with a long-dashed line with powerflows indicated. The percent LTE value on the bottom will always be 100% or greater for overloaded elements. In a similar fashion, buses with voltages below 0.95pu or above 1.05pu will be depicted with short-dashed and long-dashed lines, respectively. Continuous-duty thermal ratings are used to evaluate element loadings when the system is intact and no elements are out of service, and L.T.E. ratings are used to evaluate loadings under contingency conditions. Further discussion on the rating type to use for the “all-lines-in” cases in this report is contained in Section 5.3.

Per Massachusetts D.T.E. guidelines, loadflow diagrams are provided for the first instance that an element exceeds 100% of rating with all lines in (normal conditions) and for the first instance of a contingency overload on an element. Due to overwhelming amount of data that would have to be provided, diagrams are only included for the first contingency that overloads a particular element. Diagrams are not provided for future instances of the same contingency. They are also not provided for other contingencies that also overload the subject element, but to a lesser degree or that arise in years after the first overload. The tabular supplement the diagrams by providing all instances of overloads and doing so for loadings that exceed 95% rather than 100% in the diagrams. The tabular results show loadings above 95% to give advance warning of impending overloads.

5.3 Overview of Thermal & Voltage Analyses – 2004-2008

This analysis of the NSTAR-North system was carried out for two base generation dispatches in the downtown Boston area. All of the assumptions detailed in Section 4 are valid for each case, but Case #1 has Mystic 115kV Block 9 and New Boston out of service. This leaves no 115kV generation support in the downtown Boston area. The closest 115kV unit is Kendall Unit #4 (187MW) in Cambridge. Case #2 still has Mystic Block 9 off, but New Boston is dispatched on to provide support to the downtown and southern end of the Boston service area. .

The tabular results for Cases 1 and 2 are presented in Appendices D-1 and D-2, respectively. Each Appendix contains three tables of different results that cover years 2004 through 2008. The “(a)” and “(b)” tables contain the thermal and voltage results, respectively, of testing the system with all facilities in service. Neither one of the “(b)” voltage tables has any entries, as no voltage violations are present for Case #1 or Case #2 with all facilities in service. The capacitors were sited so that an acceptable voltage profiles would be maintained in the NSTAR-North service area through 2006 with no 115kV generation in Boston. They are sufficient to avoid voltage violations through 2008 when all facilities are in service, but voltage performance suffers under contingency conditions. The thermal results are expressed in percent of the element’s continuous-duty current rating, and the voltage results show the locations where voltage is either below 0.95pu or above 1.05pu. The “(c)” and “(d)” tables contain the thermal and voltage results, respectively, of testing the system under the contingency conditions listed in Appendix C. Element loadings are evaluated in percent of LTE ratings, and the voltage results show the locations where the post-contingency voltage moves out of the acceptable range (0.95pu-1.05pu) or drops more than 5% from its pre-contingency value. Appendices E and F contain loadflow diagrams of the system under normal and selected contingency conditions. Combined with the tabular results, they present a comprehensive overview of system performance under a variety of conditions.

It should be noted that the use of continuous ratings in the “(a)” tables of Appendix D produces results that are usually 20%-30% higher than if expressed in percent of LTE. It can be argued that emergency ratings should be used for the “all-lines-in” evaluation if we assume that the system is initially operating with one of the 115kV gas turbines out of service and an unplanned trip of the second gas turbine and the steam turbine occurs. Considering the trip of the second two units to be an N-1 contingency, LTE ratings would be used to evaluate loadings under contingency outages and with all system elements in service. The conservative approach is taken here, however, by assuming that the outage of Block 9 is a base dispatch and by evaluating element loadings by their continuous duty ratings. It doesn’t turn out to be much of an issue in this study, however, as only a few elements are loaded above their continuous ratings with all lines in, and most occur with New Boston out of service. Unless any “all-lines-in” loading is greater than about 120%-130% of the continuous rating, it will most likely turn out to be below the emergency rating. Further, it is a reasonable assumption that the N-1 contingency of the second two Block 9 units will be eliminated within the 12-hour duration of the LTE rating. Unlike this scenario, an failure-related outage of a major system element like an autotransformer would definitely require that element loadings be evaluated by continuous duty ratings, as the length of time to repair or replace the failed unit will most likely be weeks or months, not hours.

5.4 Summary of Results – Mystic Block 9 & New Boston Off – 2004-2008.

This case is analyzed first, as it places the most severe stress on the NSTAR-North system, especially in downtown Boston. As described in Sections 3 and 5.3, the only 115kV generation in the local area is Kendall Unit #4 in Cambridge. This is a plausible scenario if New Boston is retired and a complete trip of Mystic Block 9 is experienced, as has happened several times in the past. No transmission upgrades are modeled in these cases except for the capacitor banks listed in Table 1-1.

Table D-1(a) and the loadflow diagrams in Appendix E illustrate that the Kingston St - High Street sections of Cables 385-510 and 385-511 and Autotransformer 345A at Kingston Street exceed their continuous ratings with all lines in beginning in 2004. A earlier study of the Downtown Boston system recommended that series reactors be installed at the K-Street end of these cables to relieve their loading and shift it to parallel Cables 385-512 and 385-513. This was highly effective at eliminating all-lines-in and companion circuit outage overloads, but did not address loading of the Kingston Street autotransformers. In the absence of New Boston, loads in the K-Street area are almost served in a radial fashion from Kingston Street. Rather than having relatively balanced flows from generation at both ends of the 510 and 511 cables, virtually all the flow has to come from Kingston street. This causes the Kingston-High Street section to overload first, then the Kingston Transmission to Kingston Network section. Approximately 75MVAr of distribution capacitors were required at the 14.4kV buses at Dewar Street, Hyde Park, and Newton to address feeder loading, voltage issues, and the effects of a double-circuit tower contingency of Lines 240-510 and 110-522. These were added as base improvements prior to evaluation of the 2004 system.

A quantitative inspection of Table D-1(a) shows that the aforementioned sections of 115kV Cables 385-510 and 385-511 are loaded to 104% and 105%, respectively of their 154 MVA continuous-duty ratings in 2004 and increase to 109% and 108% by 2008. Considering the ratings discussion in Section 5.3, however, the loadings would all be reduced below 70% if their 241 MVA LTE ratings were applied. The same is true for the lower-rated of the two Kingston Street autotransformers, unit 345A. It is loaded to 100% of its continuous rating in 2004 and increases to 106% by 2008. The 345B unit is loaded from 96% in 2004 to 102% in 2008. If 540 MVA LTE ratings are used, the load on either transformer does not exceed 95% through 2008. In summary, then, some minor overloads exist on three downtown Boston facilities if percent loading is based on continuous ratings, but no overloads exist anywhere through 2008 if the evaluation is carried out with LTE ratings. A review of the voltage results in Table D-1(b) is unremarkable, as no violations are present through 2008.

Table D-1(c) presents a more pessimistic situation. It contains the thermal results of the contingency testing. The lack of thermal and reactive support in the K-Street area of the downtown Boston system creates some significant problems because the loads in that area must be supplied in an almost radial fashion from Kingston Street and, to a lesser degree, from Mystic. This significantly increases the loading on the Kingston Street autotransformers, the 115kV cables and facilities downstream of them, and the 345kV cables 324 and 372 that supply them. New Boston provides the necessary injection of MW and MVAr at the correct point to balance the strong 345kV autotransformer sources at Mystic and at Kingston Street. This reduces loading on the upstream sections of the interconnecting 115kV lines because tapped network station loads can be from both sides.

The most limiting 345kV contingency is loss of either of the Kingston street autotransformers, beginning in 2004. Those units load to 117% of 540MVA LTE for loss of either, and increases to

124% by 2008. Loss of one of the Kingston Street autotransformers also overloads unit 345A at Mystic by 8% of its 407 MVA LTE in 2004. That increases to 119% by 2008. The next facilities in line are the 345kV cables 324 and 372 that supply Kingston Street from Mystic. Loss of either of those cable loads the other to 109% of 844 MVA LTE in 2004, and increases to 116% by 2008. Numerous other contingencies overload the autotransformers at Kingston Street and at Mystic, but to much lesser degrees.

The worst of the 115kV contingencies occur outside of Boston. Double-circuit tower (DCT) contingencies are particularly severe, especially the one that removes Lines 282-602 and 433-507. An NSTAR project to move one of the circuits to a separate tower has recently been approved, and should be complete by the end of 2004. This will eliminate the DCT contingency and the severe overloads that accompany it. (A mitigating factor that bears mentioning, however, is that one or both of the lines on a double circuit tower can usually be restored within hours of a trip, assuming that the trip was not the result of damage to a tower or line components.) The impacts of the 282-602+433-507 contingency are relatively widespread. The most severe overload occurs on the sections of 115kV Cables 282-520 and 282-521 between Watertown and Brighton. These load to 140% and 132% LTE, respectively, as early as 2004. Phase shifter adjustments at Waltham could be used to significantly reduce these overloads, but not eliminate them. 115kV Lines 320-507 and 320-508 between Lexington and Waltham also overload for this DCT. They both reach 105% LTE in 2004 and 115% LTE in 2007. The loadflow solution would not converge at the 2008 load level.

Another DCT contingency that is quite severe removes 115kV Lines 110-522 and 240-510. This causes all of Hyde Park and Newton to be supplied radially through the Baker Street Phase Shifters. They load to approximately 130% in 2004. Unfortunately, adjustment of the phase-shifter taps will not reduce the flow through them in this instance because they are supplying radial loads that cannot be picked up from another source. The Washington Tap-Baker section of 115kV Lines 110-511 and 110-510 also overload (125% LTE) in this scenario, but since they supply the phase shifters radially, their loading is also governed purely by load requirements at Newton and Hyde Park when the 110-522 and 240-510 lines are both out.

Other line pairs that overload during contingencies include 115kV cables 329-530 and 329-531 between Brighton and North Cambridge. These reach 117% of LTE during loss of the companion circuit. This is a result of the heavy flow into Mystic Station that travels from North Cambridge through Brighton when no 115kV generation is present in Boston. Under these conditions, both cables already have pre-contingency loadings that are approximately 75% of their LTE ratings in 2004. The 115kV generation at Mystic typically reverses the flow on the Brighton-Mystic lines, and reduces the inflow from North Cambridge into Brighton.

Another overload to be aware of occurs on Lines 447-508 and 447-509 between Holbrook and Walpole. When the West Walpole 345A autotransformer is out, both lines and the five step-down stations that they serve are on a radial feed from Holbrook. The line sections closest to Holbrook load up first, as they carry the current for all five of the downstream stations. Each line section closer to Walpole carries less current until the line section closest to Walpole carries only the Walpole load current. In a similar fashion, outage of the Holbrook 345A autotransformer places the two lines and the five stations on a radial feed from West Walpole. The results are most severe when the West Walpole auto is out, as compared to the Holbrook auto at the remote end.

It should be noted that all of the aforementioned concerns are associated with New Boston out of service and Mystic 9 unavailable. These conditions are of significant concern and are in part the basis for the reliability must run contract that ISO has in place to support the continued operation of New Boston until necessary transmission system upgrades can be implemented.

5.5 Summary of Results – Mystic Block 9 Off, New Boston On – 2004-2008.

This case is considerably less severe than with no 115kV support in Boston. It considers that New Boston is available to supplement the 7600MW generation loss that an outage of Mystic Block 9 represents. With New Boston in service to provide thermal and voltage support to the K-Street and downtown Boston areas of the system, several problematic contingency violations are eliminated. Since New Boston is downstream of the Kingston Street autotransformers and the network stations that are served by Cables 385-510 and 385-511, it balances the powerflows coming in from Kingston Street and significantly unloads the two autotransformers and the 115kV and 345kV cables that are connected to them. It also significantly relieves loading on the Mystic 345A autotransformer. All contingency violations of those elements are eliminated

New Boston also significantly reduces the number of contingency violations throughout the NSTAR-North system. This is evident from a simple comparison of Tables D-1(b) and Table D-2(b); the former requires 11 pages to relate while the later (New Boston on) only requires 4 pages. Voltage profiles within Boston stay above 1.00pu in most cases before and after contingencies in 2004, but the outskirts of the 115kV system experience pre-contingency voltages in the 1.00pu range that drop below 0.95pu during contingencies. The presence of New Boston does little to relieve contingencies outside of downtown Boston. Northborough Road, a particularly challenging location to maintain voltage, has magnitudes in 2004 of 0.96pu that drop to 0.86pu during outages of either Line 240-508 or 455-507.

It is at this point that the 345kV reinforcements are scheduled to be operational, and NSTAR studies have already demonstrated that they eliminate virtually all thermal and voltage violations in the NSTAR-North system. The 345kV voltage profiles stay well within limits, but the 115kV system voltages sag below 0.95pu during contingencies as early as 2004. Low voltage violations during contingencies become particularly limiting, even with the dynamic reactive support from New Boston.

5.6 Discussion Of Limiting Contingencies

5.6.1 Overloads on 115kV Cables 385-510 and 385-511.

Overloads on 115kV cables 385-510 and 385-511 with the companion circuit out of service proved to be the most limiting 115kV downtown Boston contingency when evaluating thermal performance without any local 115kV generation support. (Kendall #4 in Cambridge was the only 115kV unit in-service in the cases.) These circuits are High Pressure Oil-Filled (HPOF) underground cables that travel between the Kingston Street "B" bus and the K-Street #2 bus. (The tie breakers at both stations are operated closed, however, so each station has effectively only one 115kV bus, and the exact connection point is irrelevant.)

Circuits 385-510 and 385-511 also serve network loads through 115kV-14.4kV transformers at Kinston Street Network Station and at High Street. Kingston Network has two transformers, each connected to one of the two lines. High Street has four transformers, two served from the 510 line and two served from the 511 line. The 14.4kV tie breakers are operated closed, however, so loss of either line immediately shifts the load current to the intact circuit.

The circuits also carry transfer current from Kingston Street Transmission Station to K-Street that adds to the current demanded by the network station loads. The stiffness of the source at Kingston Street (two 345kV-115kV autotransformers) and lack of generation at K-Street (New Boston is considered retired) results in a voltage difference that causes significant powerflow between the two stations. This adds to the load current and consumes line capacity to the point where a loss of either circuit causes the remaining circuit to approach 100% of its Long Term Emergency (LTE) rating in 2004 and exceed it after that point. Several methods of addressing this problem have been developed and evaluated in other studies.

5.6.2 Overloads on Kingston Street Autotransformers.

Companion circuit overloads on the 345A and 345B autotransformers at Kingston Street were the most limiting 345kV contingency at 2004 and 2006 load levels with no 115kV generation support in Downtown Boston. Phase-shifter adjustments at Baker Street and Waltham proved to be an effective means to push more power into Boston and to eliminate L.T.E. violations in 2004, but all import facilities were loaded almost to their full L.T.E. ratings to achieve this. A delicate balancing of import power flows was required to keep the transformers within their LTE ratings for companion circuit contingencies. Salem Harbor Units 1&2 were also dispatched to reduce loading on import lines to Boston. Their effect was minimal, however, reducing the flow on Line 148-522XY by only a few percent of its LTE rating. It was noted that it took approximately 20 MW of generation at Salem Harbor to reduce line loading on 148-522XY by 1 MVA. A similar ratio existed for 115kV Lines 282-520/521 between Waltham and Brighton. In some instances, though, this meant the difference between being within ratings or not.

All phase-shifter adjustments and reactive mitigation options had been exhausted by 2006, however, and both of the Kingston Autos were still overloaded to approximately 113% of their 540 MVA LTE ratings with the other out of service. Import lines were all loaded to their limits with either autotransformer out of service, in an attempt to reduce loading on the remaining unit. The initial contingency loading was 122% LTE, but approximately 8% of relief was achieved through the application of shunt capacitors and through phase shifter adjustments at Waltham and Baker Street. The tap changers on the Kingston autos had already been adjusted to 1.000 in the 2004 cases to reduce powerflow through the units while still maintaining acceptable secondary voltage.

The only available option to address the problem until a permanent, non-generation resolution (assumed to be the proposed 345kV cables from Holbrook to K-Street) could be installed was the phase-angle controlled interconnection with National Grid's 115kV system at Dewar Street Station. Initially, this option had been dismissed due to its relatively small impact on contingency flows through the 385-510/511 lines and through the two Kingston Street autotransformers and the 345kV lines supplying them. Prior to the plan to install heat exchangers on the Kingston-Kingston Network sections of Lines 385-510/511, the Dewar phase shifter interconnection was insufficient to eliminate companion circuit overloads on those sections of 115kV cable. Since the installation of current-limiting reactors in 2004 could more effectively mitigate the most limiting contingency (loss of 385-510 or 385-511), the phase-shifter interconnection at Dewar Street did not initially appear to be effective enough to warrant further consideration. The installation of current-limiting reactors by summer 2004 was selected as the best option to address the 385-510/511 contingencies. It effectively solved a localized problem, and could possibly provide additional benefit by helping to control fault duties once the new 345kV interconnection is in place.

While highly effective at solving the intended contingency overload, further testing revealed that the series reactors do not provide any significant relief to the two Kingston Street autotransformers or to the two 345kV lines (324 and 372) supplying them. The circuits are simply not coupled closely enough. It was not until the 2006 extreme weather case was examined in detail under all contingency conditions that it became clear that loss of either Kingston Street autotransformer still overloaded the other by approximately 3%-5% of their 540 MVA LTE ratings. This was true with all phase-shifter and other mitigation options already exhausted. An examination of the makeup of the line flows revealed a relatively small reactive component in most cases, indicating that additional shunt compensation would probably increase rather than relieve line loadings. An additional resource was required to target overloads on the 345kV lines and

transformers at Kingston Street. The best location in the local area to inject additional MW to relieve these loadings is at K-Street. This reduces power flows all the way from the source at Mystic, through Lines 324&372, through the two Kingston Street autotransformers, and through the 385-510/511 lines that terminate at K-Street.

Extreme summer peak loads in 2006 require additional capacitors beyond those just described if the proposed 345kV supply interconnection to K-Street is not in service. Without any reactive compensation, most 115kV bus voltages are below 0.95pu, with many in the 0.90pu-0.92pu range. Most downtown on-load tap changers are at their full boost taps, winding losses are prohibitively high, and secondary bus voltages are in the 0.85pu-0.88pu range. Numerous voltage violations were noted under all-lines-in and contingency conditions throughout the Boston 115kV system without generator-provided reactive support. The 345kV system, however, is still in acceptable shape due to reactive generation support provided at Mystic Station (Block 8 and Unit 7). Distribution capacitors were applied on the secondary buses at Colburn Street to further reduce line loadings and losses.

5.6.3 Impact of Mystic GCB#7 115kV Tie Breaker Operation

The initial cases that were examined had the new 115kV tie breaker GCB #7 between the old and new (G.I.S.) Mystic buses closed. The original Mystic Expansion System Impact Study determined that GCB#7 should be operated closed when the Mystic 115kV Steam Turbine was out of service so that thermal support could be provided to the three 115kV lines that travel to Everett, Woburn (211-514), and Chelsea (488-518). It also determined that it needed to be opened with all of Mystic block 9 operating so that fault duties at Mystic and the surrounding 115kV system would not exceed breaker interrupting ratings. The examinations conducted in this study, however, were aimed at evaluating downtown thermal performance without the benefit of local 115kV generation support. This differs from the goal of the original S.I.S., which was to ensure that all power from the new generation could be reliably exported out of Mystic and that fault duties would not be exceeded with all generation operating.

The impact of GCB#7's status varies with 115kV generation dispatch at Mystic. If Mystic Block 9 is operating at partial output, closing the breaker provides thermal support to Mystic and to the downtown system. Contingencies in the import paths to Boston cause an increase of power from National Grid's system in the north to flow into Mystic and supplement the imported power that was lost due to the import line contingency. The increase is manifested to varying degrees over the three lines that connect to Woburn, Chelsea, and Everett.

This works fine as long as some generation is present at Mystic 115kV. If there is no downtown 115kV generation support, however, the increase in powerflow from National Grid's system over the Q-169 and F-158 lines is significant, and the lowest rated element, F-158N, exceeds its LTE rating by approximately 19%. Although keeping the tie breaker closed lessened the impact on the NSTAR system for loss of major import elements, the recurring overload on F-158N made it unattractive as an operating strategy to supplement lost downtown generation.

In order to eliminate dependence on National Grid's supply from the north and avoid overloads on the F-158N line that occurred with almost every Boston contingency, the study was redirected to evaluate downtown performance with GCB#7 open in all cases. The study showed that the NSTAR system could supply all loads through summer 2008 without the need to close the GCB#7 tie breaker. Operation in this manner simplifies operation, and eliminates concerns over excessive fault duties related to dispatch combinations at Mystic. Secure operation, however, was only possible with all of the recommended shunt capacitors in place. The recommendations contained herein are the minimum necessary to get by through 2008 without thermal or voltage violations. This assumes that no other system upgrades are implemented and retirement of New Boston is approved.

5.6.5 Voltage Performance Without 115kV Generation Support

Extreme weather load forecasts for 2006 move the reactive demand of the system beyond its capabilities if Mystic 115kV Block 9 is unavailable subsequent to the proposed retirement of Mystic Units 4,5,6 and New Boston. This unavailability could occur through a common mode trip of the entire generation block, or if one combustion turbine was out of service and the remaining combustion turbine tripped off-line, taking the steam turbine with it. Both scenarios are considered first (N-1) contingencies, so LTE ratings are used to examining the degree of loading on circuit elements both with all lines in and for line contingencies that follow the generation contingency.

Line flows increase significantly with each year due to the high reactive loading on circuit elements, and voltages throughout the Boston 115kV system drop into the 0.95pu range in 2004 and into the 0.92pu range in 2006 for the contingency conditions studied. Voltages on the 14.4kV secondaries of substation transformers drop into the 0.70pu to 0.8pu range due to the high reactive voltage drop across the transformer windings, many of which are high-impedance to reduce 14.4kV fault duties. Shunt reactive compensation through capacitor banks is required throughout the system to support voltage and reduce line loading. The greatest benefit is when the correction is applied at the distribution load level so that the inductive losses and voltage drop across the step-down transformers is minimized.

Logistics and concerns of overcompensation when capacitors are applied at transformer secondaries, however, require that some of the additional capacitor banks be added to the 115kV transmission system. (NSTAR standard transmission capacitor banks are rated 63MVAR, 124.7kV. Since MVA_r output is directly proportional to the square of the applied voltage, the actual output at 115kV is 53.6MVA_r, and that is how they are modeled in the loadflow cases.) It must be clearly understood that all solutions to downtown Boston thermal and voltage issues in 2004 and beyond depend on a significant amount of capacitor additions to be successful without the benefit of local generation.

5.6.6 345kV Reinforcement From Holbrook to K-Street – Post 2006

A 345kV reinforcement plan for the Hyde Park and K-Street areas is currently scheduled to be in-service by the end of 2006. The basic plan is to construct a new 345kV ring bus at Canton Station #470. The existing 345kV Line 316 from Holbrook to West Walpole will be sectionalized into East and West sections, and two new 345kV cables will travel between the Canton ring bus and a new 345kV station at Hyde Park. This provides a great deal of relief to Import Line 148-522XY that serves load in the Baker Street and Hyde Park areas. The station will consist of a ring bus and a single autotransformer. Two more new 345kV cables will connect the Hyde Park ring bus with a new 345kV ring at K-Street. The new K-Street station will have two autotransformers to step the voltage down to 115kV for direct connection to the existing K-Street ring bus(es).

The impacts of the proposed reinforcements have been evaluated in detail for the post-2006 time frame in other studies, but without any modeling of the Dewar Street Phase shifter interconnection. This study examines the performance/control range of the Dewar Phase Shifters in combination with the reinforcements. This information is presented in Tables 7-1 and 7-2. Loadflow diagrams from which the tables were derived are presented in Appendices E7A(minimum 115kV Boston generation) and E7B (maximum 115kV Boston generation), respectively.

The performance of the greater Boston and Downtown Boston 345kV and 115kV systems in 2006 is significantly improved by the 345kV reinforcements. All of the contingencies listed in Appendix C were tested under minimum and maximum 115kV generation conditions in Boston. Salem Harbor, New Boston, and Mystic Units 4,5,6 were dispatched off in both cases. Once the tap settings of the phase angle regulators at Baker Street and Waltham were optimized with the new 345kV source in-service, no thermal violations were present with all lines in or during any contingencies. This is true under both minimum and maximum 115kV generation conditions in Boston. Similarly, the voltage profile was elevated relative to the 2006 system prior to the reinforcements, and no voltage violations were present under any conditions.

6. Conclusions –No 115kV Generation In Downtown Boston

The results of the study indicate that the Downtown Boston system can survive under minimum 115kV generation conditions through 2006 if the retirement of New Boston is deferred. Beyond that point, voltage profiles throughout the NSTAR-North system start to drop sharply with commensurate increases in line loading. Several of the 2007 and 2008 contingencies would not converge in the loadflow simulations, indicative of the severity of the conditions. The double-circuit tower (DCT) outages and the loss of major autotransformers were the major offenders in that category. Many system elements are operating very close to their thermal limits, however, and voltage performance is not as good as it could be. Although the control is not as smooth, switched, shunt capacitor banks can supplement the loss of reactive support. The lost MW support is also not essential to system operations through 2006 due to the presence of the Mystic 345A autotransformer. That unit also, however, is operating very close to its continuous and LTE ratings by 2006.

New Boston provides the necessary injection of MW and MVar at the correct point to balance the strong 345kV autotransformer sources at Mystic and at Kingston Street. This reduces loading on the interconnecting 115kV lines because tapped loads can be supplied more equally from both sides. It is important both as a MW source and as a MVar source. Without some sort of injection into the K-Street area, network stations tapped along the lines are primarily supplied from Kingston Street, and the line sections closest to it become heavily loaded relative to the line sections at the K-Street end. Supply to Kingston Network and High Street becomes almost radial from Kingston Street as the K-Street end contributes little to the load demands of the tapped network stations. The problem is severe enough that loss of either Line 385-510 or 385-511 becomes the most limiting contingency as early as 2004.

The reactive support associated with New Boston can be supplemented by a combination of 14.4kV and 115kV shunt capacitors to minimize MVA flows on the 385-510/511 and 385-512/513 lines, but this is effective only through 2005. After that time, though, the limiting factor is one of insufficient MW; additional capacitor applications will overcompensate the system and actually begin to increase MVA flows through the lines. The limiting contingency then becomes loss of either of the Kingston Street autotransformers. It does not surface until 2006, however, as long as the recommended capacitor banks are in-service to provide voltage support and minimize reactive flows through the system.

APPENDIX A. NEPOOL & NSTAR LOAD DATA

Summer - NEPOOL and Total New England August Capabilities and Summer Peak Load Forecast (MW) - 2002-2012											
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
NEW ENGLAND											
TOTAL CAPACITY	29783	32122	32658	32925	33460	33997	33997	33990	33990	33990	33990
ADJUSTED LOAD (1)	24699	25229	25800	26111	26401	26732	27102	27503	27933	28384	28824
NEPOOL											
1. UNADJUSTED LOAD (2)											
1.1 REFERENCE (Extreme Summer Peak Loads Modeled In Study)	26176	26787	27430	27837	28197	28597	29003	29418	29846	30283	30712
2. DEMAND SIDE MANAGEMENT (3)											
2.1 PROGRAMS	1460	1535	1602	1692	1757	1821	1856	1869	1867	1856	1845
2.2 LOSS ADJUSTMENT (5)	116	122	128	135	140	146	148	150	150	148	148
2.3 TOTAL = 2.1 + 2.2 (6)	1516	1657	1730	1827	1897	1967	2004	2019	2017	2004	1993
3. NETTED FROM LOAD											
3.1 NETTED FROM LOAD (3)	10	10	10	10	10	10	10	10	9	9	9
4. ADJUSTED LOAD (1)											
4.1 ADJUSTED REF LOAD = 1.1 - 2.3 - 3.1 (6, 7)	24590	25120	25690	26000	26290	26620	26990	27390	27820	28270	28710
4.2 INSTALLED RESERVES MW = 5.3 - 4.1	5150	6959	6925	6882	6592	6797	6964	6564	6127	5677	5237
4.3 INSTALLED RESERVES % OF LOAD = (4.2/4.1)/100	21	28	27	26	25	26	26	24	22	20	18
5. CAPACITY (8, 9, 10)											
5.1 GENERATION CLAIMED FOR CAPABILITY	27143	31188	31724	31991	31991	32526	33063	33063	33063	33063	33063
5.2 NET OF FIRM PURCHASES & SALES	2597	891	891	891	891	891	891	891	884	884	884
5.3 TOTAL (6)	29740	32079	32615	32882	32882	33417	33954	33954	33947	33947	33947

FOOTNOTES:

- (1) REFERENCE LOAD FORECAST USED MORE INFORMATION ON THE 4/103 CELT FORECAST, INCLUDING THE HIGH AND LOW BANDWIDTHS, IS AVAILABLE AT THE ISO-NE WEBSITE http://www.iso-ne.com/Historical_Data/forecast/
- (2) REPRESENTS MW UNADJUSTED LOAD LEVEL ASSOCIATED WITH A REFERENCE FORECAST HAVING A 50% CHANCE OF BEING EXCEEDED
- (3) THE 2002 VALUES ARE ESTIMATES OF ACTUAL AMOUNTS.
- (4) INCLUDED IN THE CONSERVATION VALUES ARE THE EFFECTS OF ECONOMIC DEVELOPMENT ACTIVITIES
- (5) REDUCTION IN LINE LOSSES ASSOCIATED WITH DEMAND-SIDE MANAGEMENT PROGRAMS.
- (6) MAY NOT EQUAL SUM DUE TO ROUNDING
- (7) THE 2002 PEAK LOAD SHOWN REFLECTS WEATHER NORMALIZATION PRIOR TO WEATHER NORMALIZATION, THE 2002 SUMMER RECONSTITUTED PEAK OF 25516 MW THE ACTUAL METERED 2002 SUMMER PEAK OF 25348MW OCCURRED ON AUGUST 14, 2002 AT 1500 HOURS ENDING, AND INCLUDED LOAD REQUIREMENTS OF COMPANIES SERVED BY NEPOOL PARTICIPANTS
- (8) CAPABILITIES INCLUDE EXISTING CAPACITY PLUS THE CHANGES SHOWN ON PAGE 4
- (9) 2002 EXISTING SUMMER CAPABILITY AS OF 8/102
- (10) NOT REFLECTED IN THESE TOTALS IS THE ANTICIPATED TRANSFER OF CAPACITY OWNERSHIP ASSOCIATED WITH THE PENDING SALES OF NEW ENGLAND GENERATORS EXPECTED TO BE FINALIZED BY THE END OF 2003

Table A-1(a). NEPOOL Summer Peak Load Data - 2003 C.E.I.T. Report

Station Name	Station Information			2004 Extreme Summer Peak				2005 Extreme Summer Peak				2006 Extreme Summer Peak				2007 Extreme Summer Peak				2008 Extreme Summer Peak			
	Station #	P.F.	Loadflow Bus #	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr		
Hawkins Street	2	0.94	71008	92.0	86.2	32.2	93.0	87.1	32.6	94.0	88.0	32.9	96.0	89.9	33.6	95.0	89.0	33.3					
L Street L-4	4	0.94	70997	10.0	9.4	3.5	10.0	9.4	3.5	10.0	9.4	3.5	10.0	9.4	3.5	10.0	9.4	3.5					
L Street L-5	4	0.94	70998	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
L Street L-6	4	0.94	70999	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
L Street L-7	4	0.94	71000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Chatham Street	12	0.96	71007	112.0	108.0	29.6	113.0	109.0	29.9	114.0	109.9	30.1	118.0	113.8	31.2	123.0	118.6	32.5					
High Street	53	0.91	70996	108.0	97.9	45.6	109.0	98.8	46.0	110.0	99.7	46.4	110.0	99.7	46.4	111.0	100.6	46.8					
Medway	65	0.95	71025	52.0	49.3	16.7	53.0	50.2	17.0	53.0	50.2	17.0	54.0	51.1	17.3	55.0	52.1	17.6					
Carver Street	71	0.90	71011	83.0	75.0	35.5	84.0	75.9	36.0	85.0	76.8	36.4	86.0	77.7	36.8	88.0	79.5	37.7					
Andrew A	106	0.89	71003	67.0	59.7	30.4	62.0	55.2	28.2	59.8	53.2	27.2	61.3	54.6	27.8	62.3	55.5	28.3					
Andrew B	106	0.89	71004	67.0	59.7	30.4	62.0	55.2	28.2	59.8	53.2	27.2	61.3	54.6	27.8	62.3	55.5	28.3					
Baker Street	110	0.97	71042	83.0	80.8	19.1	83.0	80.8	19.1	84.0	81.8	19.3	85.0	82.7	19.5	87.0	84.7	20.0					
Hopkinton A	126	0.94	71032	23.0	21.5	8.0	26.0	24.4	9.1	28.0	26.2	9.8	29.0	27.2	10.1	30.5	28.6	10.7					
Hopkinton B	126	0.94	71033	23.0	21.5	8.0	26.0	24.4	9.1	28.0	26.2	9.8	29.0	27.2	10.1	30.5	28.6	10.7					
Walpole	146	0.95	71048	92.0	87.5	28.5	92.0	87.5	28.5	93.0	88.4	28.8	94.0	89.4	29.1	96.0	91.3	29.7					
Needham	148	1.00	71046	83.0	82.7	6.5	84.0	83.7	6.6	85.0	84.7	6.7	86.0	85.7	6.8	88.0	87.7	6.9					
Woburn	211	0.96	70961	141.0	135.8	37.9	142.0	136.8	38.2	143.0	137.7	38.4	145.0	139.7	39.0	147.0	141.6	39.5					
Leland Street	240	0.96	71028	81.0	77.4	23.8	82.0	78.4	24.1	84.0	80.3	24.7	85.0	81.2	25.0	86.0	82.2	25.3					
Mystic 14.4kV #1	250	0.91	70972	52.4	47.9	21.3	52.7	48.2	21.4	53.0	48.4	21.5	53.8	49.2	21.9	54.7	50.0	22.2					
Mystic 14.4kV #2	250	0.91	70973	52.4	47.9	21.3	52.7	48.2	21.4	53.0	48.4	21.5	53.8	49.2	21.9	54.7	50.0	22.2					
Mystic 14.4kV #3	250	0.91	70974	52.4	47.9	21.3	52.7	48.2	21.4	53.0	48.4	21.5	53.8	49.2	21.9	54.7	50.0	22.2					
Mystic 24kV #1	250	0.91	70975	13.9	12.7	5.6	14.0	12.7	5.7	14.0	12.8	5.7	14.3	13.0	5.8	14.5	13.2	5.9					
Mystic 24kV #2	250	0.91	70976	13.9	12.7	5.6	14.0	12.7	5.7	14.0	12.8	5.7	14.3	13.0	5.8	14.5	13.2	5.9					
Sherborn	274	0.97	71026	52.0	50.7	11.7	53.0	51.6	12.0	53.0	51.6	12.0	54.0	52.6	12.2	55.0	53.6	12.4					
Waltham	282	0.96	70967	139.0	133.2	39.9	140.0	134.1	40.1	141.0	135.1	40.4	143.0	137.0	41.0	145.0	138.9	41.6					

Table A-2(a). NSTAR-North Loads Modeled In Study Stations #2 - #282.

Station Information			2004 Extreme Summer Peak			2005 Extreme Summer Peak			2006 Extreme Summer Peak			2007 Extreme Summer Peak			2008 Extreme Summer Peak			
Station Name	Station #	P.F.	Loadflow Bus #	MVA	MW	MVAR	MVA	MW	MVAR									
Newton A&B	292	0.98	71043	112.0	109.6	22.9	113.3	110.9	23.2	114.0	111.6	23.3	116.0	113.5	23.8	117.0	114.5	24.0
Newton C	292	0.98	71044	56.0	54.8	11.5	56.7	55.5	11.6	57.0	55.8	11.7	58.0	56.8	11.9	59.0	57.7	12.1
Lexington	320	0.93	70966	72.0	67.0	26.4	73.0	67.9	26.8	73.0	67.9	26.8	75.0	69.8	27.5	76.0	70.7	27.9
Brighton 14.4kV	329	0.94	70969	203.0	191.8	66.5	183.0	172.9	60.0	195.0	184.2	63.9	205.0	193.7	67.2	212.0	200.3	69.5
Brighton 24kV	329	0.95	70970	15.0	14.3	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sudbury	342	0.96	71030	40.0	38.4	11.0	41.0	39.4	11.3	42.0	40.4	11.6	42.0	40.4	11.6	43.0	41.3	11.9
Colburn Street A	350	0.93	88852	0.0	0.0	0.0	37.8	35.1	13.9	67.5	62.8	24.8	67.5	62.8	24.8	67.5	62.8	24.8
Colburn Street B	350	0.93	88853	0.0	0.0	0.0	37.8	35.1	13.9	67.5	62.8	24.8	67.5	62.8	24.8	67.5	62.8	24.8
North Woburn	375	0.94	70962	98.0	92.1	33.4	101.0	95.0	34.4	103.0	96.8	35.1	104.0	97.8	35.4	106.0	99.7	36.1
New K-Street A	385D	0.94	88836	90.0	84.2	31.7	97.0	90.8	34.2	102.0	95.5	36.0	104.0	97.3	36.7	106.0	99.2	37.4
New K-Street B	385D	0.94	88837	90.0	84.2	31.7	97.0	90.8	34.2	102.0	95.5	36.0	104.0	97.3	36.7	106.0	99.2	37.4
Burlington	391	0.94	70963	118.0	111.1	39.6	118.0	111.1	39.6	120.0	113.0	40.3	122.0	114.9	41.0	124.0	116.8	41.7
Somerville	402	0.99	70971	0.0	12.5	6.8	0.0	12.5	6.8	0.0	12.5	6.8	0.0	12.5	6.8	0.0	12.5	6.8
Maynard	416	0.97	71031	82.0	79.7	19.1	81.0	78.8	18.9	82.0	79.7	19.1	83.0	80.7	19.4	85.0	82.7	19.8
Spence Street	433	0.98	71029	123.0	120.0	26.8	124.0	121.0	27.1	124.0	121.0	27.1	127.0	123.9	27.7	128.0	124.9	27.9
Trapelo Road	450	0.94	70966	84.0	79.3	27.7	85.0	80.3	28.0	85.0	80.3	28.0	87.0	82.1	28.7	88.0	83.1	29.0
W. Framingham	455	0.97	71027	60.0	58.3	14.3	60.0	58.3	14.3	61.0	59.2	14.5	62.0	60.2	14.8	63.0	61.2	15.0
Dover	456	0.98	71047	30.0	29.3	6.6	30.0	29.3	6.6	30.0	29.3	6.6	31.0	30.2	6.8	31.0	30.2	6.8
Watertown	467	0.99	70968	138.0	136.5	20.6	138.0	136.5	20.6	139.0	137.4	20.7	141.0	139.4	21.0	143.0	141.4	21.3
Canton	470	0.92	71049	95.0	87.6	36.7	95.0	87.6	36.7	96.0	88.5	37.1	97.0	89.5	37.5	99.0	91.3	38.3

Table A-2(b). NSTAR-North Loads Modeled In Study (Stations #292 - #470)

Station Information			2004 Extreme Summer Peak				2005 Extreme Summer Peak				2006 Extreme Summer Peak				2007 Extreme Summer Peak				2008 Extreme Summer Peak			
Station Name	Station #	P.F.	Loadflow Bus #	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr	MVA	MW	MVAr	
Dewar A	483	0.92	71005	69.0	63.6	26.8	59.0	54.4	22.9	59.5	54.8	23.1	60.5	55.8	23.5	61.5	56.7	23.5	61.5	56.7	23.9	
Dewar B	483	0.92	71006	69.0	63.6	26.8	59.0	54.4	22.9	59.5	54.8	23.1	60.5	55.8	23.5	61.5	56.7	23.5	61.5	56.7	23.9	
Chelsea	488	0.90	70979	94.0	84.6	41.1	96.0	86.4	41.9	99.0	89.1	43.3	102.0	91.7	44.6	104.0	93.5	45.4				
Scotia Street	492	0.90	71012	149.0	134.8	63.5	129.0	116.7	55.0	130.0	117.6	55.4	133.0	120.3	56.7	136.0	123.0	57.9				
Hyde Park	496	0.93	71045	167.0	156.0	59.5	164.5	153.7	58.6	155.5	145.3	55.4	158.5	148.1	56.5	160.5	150.0	57.2				
Kingston Street	514	0.90	70995	139.0	124.9	61.0	140.0	125.8	61.4	142.0	127.6	62.3	145.0	130.3	63.6	147.0	132.1	64.5				
Hartwell Avenue	533	0.95	70964	93.0	88.4	28.8	93.0	88.4	28.8	94.0	89.4	29.1	95.0	90.3	29.4	97.0	92.2	30.1				
Prospect A	819	0.99	71108	38.5	38.2	5.0	38.5	38.2	5.0	38.5	38.2	5.0	39.5	39.2	5.1	40.0	39.7	5.2				
Prospect B	819	0.99	71109	38.5	38.2	5.0	38.5	38.2	5.0	38.5	38.2	5.0	39.5	39.2	5.1	40.0	39.7	5.2				
Alewife	828	0.98	71111	111.0	108.3	24.5	111.0	108.3	24.5	112.0	109.2	24.7	114.0	111.2	25.2	115.0	112.2	25.4				
Putnam	831	0.96	71110	76.7	73.4	22.3	80.0	76.5	23.3	82.7	79.1	24.1	86.7	82.9	25.2	89.0	85.1	25.9				
Putnam	831	0.96	71125	38.3	36.6	11.1	40.0	38.3	11.6	41.3	39.5	12.0	43.3	41.4	12.6	45.0	43.1	13.1				
E. Camb/Kendall	875	0.96	71123	146.0	140.2	40.9	157.0	150.7	44.0	164	157.4	45.9	170	163.2	47.6	175	168.0	49.0				
MWRA			71010		13.2	4.4		13.2	4.4		13.2	4.4		13.2	4.4		13.2	4.4				
MBTA			71009		35.3	7.9		35.3	7.9		35.3	7.9		35.3	7.9		35.3	7.9				
NSTAR-North Station Load Totals:				4,055	1,349		4,099	1,363		4,207	1,401		4,291	1,429		4,366	1,454					

Table A-2(c). NSTAR-North Loads Modeled In Study (Stations #483 - MBTA)

APPENDIX B-1. CASE SUMMARIES: BLOCK 9 OFF, NEW BOSTON OFF.

	2004	2005	2006	2007	2008
NEPOOL Load	26,659	26,961	27,333	27,788	28,183
NEPOOL Losses	747	752	772	820	839
NEPOOL Load + Losses	27,406	27,713	28,105	28,608	29,022
NSTAR-North MW	4,055	4,099	4,207	4,291	4,366
NSTAR-North MVar	1,349	1,363	1,401	1,429	1,454
NSTAR-North MVA	4,274	4,320	4,434	4,523	4,602
Boston Import (MW)	3,591	3,675	3,819	3,941	4,042
North-South (MW)	2,599	2,618	2,597	2,894	2,865
East-West (MW)	2,382	2,404	2,393	2,403	2,400
SEMA/RI Export (MW)	2,725	2,808	2,975	2,791	2,936
	MW	MX	MW	MX	MW
Mystic Units 4,5,6	0	0	0	0	0
Mystic Unit 7	565	149	565	109	565
Mystic Block 8	706	448	706	328	706
Mystic Block 9	0	0	0	0	0
New Boston	0	0	0	0	0
Kendall CT 4	187	37	187	30	187
Salem Harbor	302	111	302	111	302
	MX	MW	MX	MW	MX

D2.2004. NO UPGRD.75MVAR CAPS@496,292,483.MYS456,BLK9,NB OFF
MYS7&8,SH1-3,KEND ON. BI13591.EW2381.NS2599.SRIEX2725. 27.4GW

GENERATION																	
	V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX			
73562	MILL#2	0.999	862	862	161	73563	MILL#3	0.994	1146	1146	161	73555	MIDDTN#2	1.027	117	117	54*
73556	MIDDTN#3	1.002	233	233	77	73557	MIDDTN#4	1.025	400	400	200*	73558	MONTV#5	0.000	81	0	0
73559	MONTV#6	1.016	402	402	194	73551	NORHAR#1	0.987	162	162	9	73552	NORHAR#2	0.000	168	0	0
73646	BPTHBR#1	0.000	0	0	0	73647	BPTHBR#2	1.009	170	170	115*	73648	BPTHBR#3	0.994	375	375	130
73549	SMD1112J	0.000	93	0	0	73560	SMD1314J	0.000	93	0	0	72665	COLFAX	0.000	75	0	0
73594	WALL_LV1	0.000	102	0	0	73595	WALL_LV2	0.000	102	0	0	73596	WALL_LV3	0.000	51	0	0
73651	NH_HARBR	0.989	447	447	175*	73553	DEVON#7	1.019	107	107	47*	73554	DEVON#8	1.016	107	107	47*
73574	MILFD#1	0.000	305	0	0	73575	MILFD#2	0.000	305	0	0	73579	TOW_ST1	0.000	188	0	0
73580	TOW_GT1	0.000	181	0	0	73581	TOW_GT2	0.000	181	0	0	73588	MERIDEN1	1.057	305	305	148
73589	MERIDEN2	1.057	305	305	148	73565	LAKERD#1	0.000	310	0	0	73566	LAKERD#2	0.000	310	0	0
73567	LAKERD#3	0.000	310	0	0	72986	BERKPWR	0.000	305	0	0	73085	MT.TOM	0.000	146	0	0
72372	BP #1 GN	1.031	241	241	115	73588	MERIDEN1	1.057	305	305	148	73589	MERIDEN2	1.057	305	305	148
72375	BP #2 GN	1.031	241	241	115	72370	BP #3 GN	1.018	605	605	42	72371	BP #4 GN	1.017	425	425	31
72661	MANCHO1A	1.012	119	119	32	72662	MANCH10A	0.000	119	0	0	72663	MANCH11A	1.012	119	119	32
72666	FRSQ_SC1	0.994	46	46	-5	72667	FRSQ_SC2	0.000	46	0	0	72668	FRSQ_SC3	0.000	46	0	0
71521	SOM_G5	0.000	69	0	0	71522	SOM_G6	0.000	105	0	0	71531	OSPI_PF	1.013	77	77	10
71532	OSP2_PF	1.013	77	77	10	71533	OSP3_PF	1.013	108	108	13	71534	OSP4_PF	1.013	77	77	10
71535	OSP5_PF	1.013	77	77	10	71536	OSP6_PF	1.013	108	108	13	72671	HOPE_G1	1.071	180	180	62
72672	HOPE_G2	1.067	180	180	62	72673	HOPE_G3	1.072	185	185	62	73652	BE_11	0.000	170	0	0
71653	Bb_12	0.000	170	0	0	73654	BE_10_ST	0.000	180	0	0	71084	NEA_GTPF	1.048	111	111	40*
71085	NEA_GTPF	1.048	110	110	40*	71086	NEA_STPF	1.065	80	80	55*	71095	ANPBLCK1	1.085	290	290	119
71096	ANPBLCK2	1.085	290	290	119	72373	MPLP_1PF	1.023	109	109	53*	72374	MPLP_2PF	1.005	45	45	27*
72371	BELL_#1	1.095	290	290	150*	72378	BELL_#2	1.095	290	290	150*	71394	DIGHTON	0.000	185	0	0
71719	POTTER	1.033	89	89	-10	71743	TAU_9A,8	1.041	55	55	24	71744	TAUNT_G9	1.049	85	85	52*
70909	EDGR-GT1	1.040	215	215	22	70910	EDGR-GT2	1.040	215	215	22	70911	EDGR-ST1	1.038	276	276	22
71069	MAPR1_PF	0.000	106	0	0	73070	MAPR2_PF	0.000	106	0	0	73071	MAPR3_PF	0.000	95	0	0
72669	TIVER_G1	1.021	189	189	14	72670	TIVER_G2	1.023	92	92	7	71251	CANAI_G1	1.036	566	587	239*
71252	CANAL_G2	1.015	576	580	120*	71094	PLGRM_G1	1.038	734	734	168	70825	MYS-GT11	0.000	215	0	0
70826	MYS-GT12	0.000	215	0	0	70827	MYS-ST13	0.000	310	0	0	70822	MYS-ST10	1.052	276	276	99
70823	MYST-GT9	1.053	215	215	99	70824	MYST-GT8	1.053	215	215	99	71060	MYST_G4	0.000	133	0	0
71061	MYST_G5	0.000	129	0	0	71062	MYST_G6	0.000	136	0	0	71063	MYST_G7	1.043	565	565	294
71074	N.BOST_2	0.000	380	0	0	71946	SALEM_G1	1.024	81	81	32*	71947	SALEM_G2	1.022	78	78	29*
71948	SALEM_G3	1.019	143	143	50*	71949	SALEM_G4	0.000	400	0	0	71126	KEND_CT	1.035	187	187	37
71123	KENDALL_1	0.025	63	63	32*	71124	KND_JETS	1.025	40	20	0	91787	TEWK-CT3	0.000	215	0	0
91786	TEWK-CT2	0.000	215	0	0	91787	TEWK-CT1	0.000	215	0	0	91814	AES-CT1	1.044	280	279	49
91815	AES-CT2	1.042	280	279	46	91816	AES-ST	1.038	280	280	35	91972	LOWELL	0.000	98	0	0
73072	ALTL1_PF	1.037	65	65	25	73073	ALT34_PF	1.036	81	81	25	71945	RESCO	1.042	33	33	20*
70010	CONED_G1	1.009	169	169	58	70011	CONED_G2	1.009	169	169	58	70012	CONED_G3	1.006	195	195	58
72869	SHRK_G1	1.019	1150	1150	422	72868	NWNCT_G1	0.000	422	0	0	72870	SCHILLER	0.000	50	0	0
72871	SCHILLER	0	0	0	0	72872	SCHILLER	0.000	50	0	0	72866	MERM_G1	1.040	113	113	33
72867	MERM_G2	1.040	320	320	93	70365	WF_WY_#1	1.011	57	57	6	70366	WF_WY_#2	1.011	57	57	6
70367	WF_WY_#3	1.011	125	125	13	70368	WF_WY_#4	1.061	636	636	242*	70377	AEC_G1	1.040	58	58	6
70378	AEC_G2	0.000	58	0	0	70379	AEC_G3	1.040	58	58	6	70381	RPA_CG1	1.040	179	179	36
70382	RPA_SG2	1.040	94	94	13	70060	MIS_GT1	0.000	179	0	0	70061	MIS_GT2	0.000	179	0	0
70062	MIS_ST	0.000	191	0	0	70389	BUCKS_G4	1.040	191	191	79	70705	VTYAK_G	0.972	563	563	150*
70386	WBK_G1	1.040	185	185	32	70387	WBK_G2	1.040	185	185	32	70388	WBK_G3	1.040	196	196	35
73083	NRTHFD12	0.992	540	270	80	73084	NRTHFD34	0.000	540	0	0	72512	BRSPW_G1	0.995	294	294	73
72513	BRSPW_G2	0.000	294	0	0	72243	MILLENST	1.019	273	273	70	72244	MILLENST	1.015	117	117	31

	MW	MX		MW	MX		MW	MX
MILLSTONE	2008	322	MIDDLETOWN	750	331	MONTVILLE	402	194
NORWALK_HARBOR	162	9	NEW_HAVEN_HBR	447	175	BRIDGEPORT_HBR	545	245
S.MEADOW_CRR-A-C	77	0	WALLINGFORD	0	0	TOWANTIC	0	0
DEVON	214	94	BRAYTON_POINT	1512	302	MANCHESTER_ST	284	58
SOMERSET	0	0	OCEAN_STATE_PWR	523	64	BE-CT	0	0
HOPE_ENERGY	545	186	NEA-BELLINGHAM	301	135	CANAL	1167	359
SITHE-MYSTIC345	706	298	MYSTIC_4&5&6	0	0	SITHE-MYSTIC115	0	0
KENDALL_13..8	83	32	KENDALL_REPOWER	187	37	GE-ALT1	146	51
SITHE-EDGAR	706	67	POTTER-MA	89	-10	TAUNTON-MA	140	76
SALEM_HARBOR	302	111	ANDROSCOGGIN_EC	115	13	RPA	273	49
WESTBROOK-ME	565	100	M.I.S.-ME	0	0	NU-NEWINGTON	0	0
CONED-NEWINGTON	533	174	COPERFORD-NH	133	-2	MOORE-NH	139	20
SCHILLER-NH	0	0	MERRIMACK-NH	433	126	AES-LONDONDERRY	837	130
UAE-TEWKSURY	0	0	WYMAN	875	267	BEAR_SWAMP	294	73
NORTFIELD	270	80	STONY_BROOK	412	106	MASS_POWER	0	0
ANP-BELLINGHAM	580	300	ANP-BLACKSTONE	580	238	EMI-TIVERTON	281	22
MILLENNIUM	390	101	IDC-BELLINGHAM	0	0	MILFORD_PWR-CT	153	80

	INTERFACE FLOWS										
NB-NE	700	700	-43	MEYANKEE-SOUTH	1350	325	-57	MAINE-NH	1400	1250	-6
NNE-SCOBIE+394	2550	2312	211	SEABROOK-SOUTH	1400	1367	230	NORTH-SOUTH	3000	2599	63
CMFD/MOORE-SO	920	166	-13	SNYPOND-SOUTH	4000	2254	9	CONN_EXPORT	2100	-1801	129
CONN-MASS	***	-678	157	CONN-RI	****	-837	26	SW_CONN_IMPORT	1700	2250	-28
BOSTON_IMPORT	2600	3591	58	NEMA/BOS_IMPORT	3200	4114	106	SEMA/RI_EXPORT	1900	2725	189
SEMA_EXPORT	1400	607	-134	GREATER RI EXP	****	2120	259	CONVEX-REMVEC	****	-2019	155
EAST-WEST	2000 (2200)	2381	73	NY-NE	2200 (1700)	21	-58	PV-20	****	86	-7

HVDC TRANSFERS FROM H-Q

CHAT-1 = 0
MADAWASK = 150

CHAT-2 = 0
PHII-P1 = 1000

HIGHGATE = 215
PHII-P2 = 1000

BUS VOLTAGES

	V	LMT		V	LMT		V	LMT	
70001 CHESTER	345	341.	70002 ORRINGTN	345	346.	70027 ORRINGTN	115	117.	
70003 MAXCYS	345	350.	70170 BOWMAN	115	121. H	70003 MAXCYS	345	350.	
70120 MAXCYS	115	123. H	70512 ESX B-2	115	115. L	70086 ME YANK	345	351.	
70087 SUROWIEC	345	352.	70090 BUXTON	345	353.	72692 NWGTN345	345	357.	
72694 SEBRK345	345	357.	70487 COOL 345	345	353.	71789 TEWKS	345	356.	
70759 MYSTIC	345	360.	71797 MILLBURY	345	354.	72923 LUDLOW	345	346.	
72926 NRTHFLD	345	352.	73106 SOUTHGTN	345	351.	73108 CARD	345	352.	
73109 MONTVILLE	345	357.	73110 MILLSTNE	345	357.	73116 MIDDLETWN	345	357.	
71801 BRAYTN P	345	358.	71811 KENT CO.	345	353.	71336 SHERMAN	345	355.	
71338 OS POWER	345	355.	71337 WFARNUM	345	354.	70772 W MEDWAY	345	356.	
70780 WWALP345	345	355.	70783 PILGRIM	345	358.	70773 NEA 336	345	358.	
71193 CANAL	345	358.	71133 CARVER	345	356.	70795 FRMNCHAM	230	233.	
70818 MYSTC MA	115	118.	70900 HOLBROOK	115	118.	70901 EDGAR	115	119.	
71891 SALEM HR	115	117.	72096 MILLBURY	115	111.	71377 SOMERSET	115	116.	
72277 MIDWEYMT	115	118.	71403 WFARNUM	115	117.	72584 HARTAVE	115	119.	
72544 JOHNSTN1	115	119.	0.0	72545 JOHNSTN2	115	119.	72560 DRUMROCK	115	117.
72565 KENT CO	115	117.	0.0	72572 W.KINGST	115	113.			0.0
AREA/ZONE TOTALS									
NEPOOL_GEN	24416	NEPOOL_LOAD	26659	NEPOOL_LOSS	747	NEPOOL_INT	-2997		

D2.2005. T&D CAPS, NO UPGRADES. MYS456,BLK9,SH4,NEW BOS OFF.
MYS768,KEND,SH1-3 ON.BI=3675.EW2404.NS2618.SRIEX2808. 27.7GW

GENERATION																	
	V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX			
73562	MILL#2	1.000	862	862	174	73563	MILL#3	0.996	1146	1146	174	73555	MIDDTN#2	0.000	117	0	0
73556	MIDDTN#3	0.989	233	233	87*	73557	MIDDTN#4	1.024	400	400	200*	73558	MONTV#5	1.006	81	81	27*
73559	MONTV#6	1 015	402	402	183	73551	NORHAR#1	0.985	162	162	6	73552	NORHAR#2	0.985	168	168	6
73646	BPTHBR#1	0.000	0	0	0	73647	BPTHBR#2	1.009	170	170	115*	73648	BPTHBR#3	0.993	375	375	124
73549	SMD1112J	0.000	93	0	0	73550	SMD1314J	0.000	93	0	0	72665	COLFAX	1 010	75	75	-9
73594	WALL_LV1	0.000	102	0	0	73595	WALL_LV2	0.000	102	0	0	73596	WALL_LV3	0.000	51	0	0
73651	NH HARBR	0.987	447	447	175*	73553	DEVON#7	1.019	107	107	47*	73554	DEVON#8	1.016	107	107	47*
73574	MILFD#1	0 000	305	0	0	73575	MILFD#2	0.000	305	0	0	73579	TOW_ST1	0.000	188	0	0
73580	TOW GT1	0.000	181	0	0	73581	TOW GT2	0.000	181	0	0	73588	MERIDEN1	1.063	305	305	165*
73589	MERIDEN2	1 063	305	305	165*	73565	LAKERD#1	0.000	310	0	0	73566	LAKERD#2	0.000	310	0	0
73567	LAKERD#3	0 000	310	0	0	72986	BERKPWR	0.000	305	0	0	73085	MT.TOM	0.000	146	0	0
72372	BP #1 GN	0.000	241	0	0	73588	MERIDEN1	1.063	305	305	165*	73589	MERIDEN2	1 063	305	305	165*
72375	BP #2 GN	1.024	241	241	117*	72370	BP #3 GN	1.020	605	605	65	72371	BP #4 GN	1.022	425	425	49
72661	MANCH09A	1.006	119	119	23	72662	MANCH10A	1.006	119	119	23	72663	MANCH11A	1.006	119	119	23
72666	FRSQ SC1	0.000	46	0	0	72667	FRSQ SC2	0.000	46	0	0	72668	FRSQ SC3	0.994	46	46	-5
71521	SOM_G5	1.000	69	69	0	71522	SOM_G6	0.946	105	105	0	71531	OSPI_PF	1.012	77	77	9
71532	OSP2_PF	1.012	77	77	9	71533	OSP3_PF	1.012	108	108	12	71534	OSP4_PF	1.012	77	77	9
71535	OSP5_PF	1.012	77	77	9	71536	OSP6_PF	0.000	108	0	0	71561	HOPPE_G1	1.071	180	180	62
72672	HOPPE_G2	1 068	180	180	62	72673	HOPPE_G3	1.072	185	185	62	73652	BE_11	0.000	170	0	0
73653	BE_12	0.000	170	0	0	73654	BE_10_ST	0.000	180	0	0	71084	NEA_GTPF	1.049	111	111	40*
71085	NEA_GTPF	1 049	110	110	40*	71086	NEA_STPF	1.066	80	80	55*	71095	ANPBLCK1	1.071	290	290	89
71096	ANPBLCK2	1 071	290	290	89	72373	MPLP_1PF	1.029	109	109	53*	72374	MPLP_2PF	1.012	45	45	27*
72377	BELL #1	1 097	290	290	150*	72378	BELL #2	1.097	290	290	150*	71394	DIGHTON	0.000	185	0	0
71719	POTTER	1.032	89	89	-10	71743	TAU_9A,8	1.002	55	55	14	71744	TAUNT_G9	1.049	85	85	52*
70909	EDGR-GT1	1 035	215	215	12	70910	EDGR-GT2	1.035	215	215	12	70911	EDGR-ST1	1.035	276	276	18
71069	MAPR1_PF	0.000	106	0	0	73070	MAPR2_PF	0.000	106	0	0	73071	MAPR3_PF	0.000	95	0	0
72669	TIVER_G1	1.018	189	189	9	72670	TIVER_G2	1.020	92	92	5	71251	CANAL_G1	1.038	566	567	238
71252	CANAL_G2	1 017	576	580	120*	71094	PLGRM_G1	1.038	734	734	157	70825	MYS-ST11	0.000	215	0	0
70826	MYS5-GT12	0.000	215	0	0	70827	MYS-ST13	0 000	310	0	0	70822	MYS-ST10	1 045	276	276	19
70823	MYST-GT9	1.046	215	215	19	70824	MYST-GT8	1 046	215	215	19	71060	MYST_G4	0 000	133	0	0
71061	MYST_G5	0.000	129	0	0	71062	MYST_G6	0 000	136	0	0	71063	MYST_G7	1.043	565	565	295
71074	N_BOST	> 0.000	380	0	0	71946	SALEM_G1	1.023	81	81	32*	71947	SALEM_G2	1.022	78	78	29*
71948	SALEM_G3	1 018	143	143	50*	71949	SALEM_G4	0.000	400	0	0	71126	KEND_CT	1.035	187	187	24
71123	KENDALL	1 023	63	63	32*	71124	KND_JETS	1.025	40	20	1	91785	TEWK-CT3	0.000	215	0	0
91786	TEWK-CT2	0.000	215	0	0	91787	TEWK-CT1	0.000	215	0	0	91814	AES-CT1	1.043	280	279	47
91815	AES-CT2	1.041	280	279	44	91816	AES-ST	1.035	280	280	31	91972	LOWELL	0.000	98	0	0
73072	ALTL2_PF	1 029	65	65	18	73073	ALT34_PF	1.028	81	81	18	71945	RESCO	1.042	33	33	20*
70010	CONED-G1	1 008	169	169	56	70011	CONED-G2	1.008	169	169	56	70012	CONED-G3	1.005	195	195	56
72869	SDRR_G1	1 018	1150	1150	409	72868	NWNGT_G1	0.000	422	0	0	72870	SCHILLER	0.000	50	0	0
72871	SCHILLER	0.988	50	50	25*	72872	SCHILLER	0.988	50	50	25*	72866	MERM_G1	1.041	113	113	35
72867	MERM_G2	1 042	320	320	99	70365	WF_WY #1	1.011	57	57	6	70366	WF_WY #2	1.011	57	57	6
70367	WF_WY #3	1 011	125	125	12	70368	WBK_G2	1.040	185	185	31	70388	WBK_G3	1.040	196	196	34
70378	AEC_G2	1 040	58	58	7	70379	AEC_G3	1.040	58	58	7	70381	RPA_CG1	1.040	179	179	40
70382	RPA_SG2	1.040	94	94	15	70060	MIS_GT1	0 000	179	0	0	70061	MIS_GT2	0.000	179	0	0
70062	MIS_ST	0 000	191	0	0	70389	BUCKS_G4	1.040	191	191	85	70705	VTYAK_G	0.972	563	563	150*
70386	WBK_G1	1.040	185	185	31	70387	WBK_G2	1.040	185	185	31	70388	WBK_G3	1.040	196	196	34
73083	NRTHFD12	0.993	540	270	80	73084	NRTHFD34	0.000	540	0	0	72512	BRSWP_G1	0.994	294	294	71
72513	BR5WP_G2	0.000	294	0	0	72243	MILLENT1	1.016	273	273	64	72244	MILLENST1	1 013	117	117	29

	MW	MX		MW	MX		MW	MX
MILLSTONE	2008	347	MIDDLETOWN	633	287	MONTVILLE	483	210
NORWALK_HARBOR	330	11	NEW_HAVEN_HBR	447	175	BRIDGEPORT_HBR	545	239
S_MEADOW_CRR-A-C	77	0	WALLINGFORD	0	0	TOWANTIC	0	0
DEVON	214	94	BRAYTON_POINT	1271	231	MANCHESTER_ST	403	64
SOMERSFT	174	0	OCEAN_STATE_PWR	416	47	BE-CT	0	0
HOPE_LNERY	545	187	NEA-BELLINGHAM	301	135	CANAL	1167	358
SITHE-MYSTIC345	706	58	MYSTIC_4&5&6	0	0	SITHE-MYSTIC115	0	0
KENDALL_13..8	83	34	KENDALL_REPOWER	187	24	GE-ALT1	146	36
SITHE-EDGAR	706	43	POTTER-MA	89	-10	TAUNTON-MA	140	66
SALEM_HARBOR	302	111	ANDROSCOGGIN_EC	173	21	RPA	273	55
WESTBROOK-ME	565	96	M_I.S.-ME	0	0	NU-NEWINGTON	0	0
CONED-NEWINGTON	533	167	CORIFORD-NH	133	0	MOORE-NH	139	26
SCHILLER-NH	100	50	MERRIMACK-NH	433	133	AES-LONDONDERRY	837	121
UAC-TWKSURY	0	0	WYMAN	875	267	BEAR_SWAMP	294	71
NORTHFIELD	270	80	STONY_BROOK	412	106	MASS_POWER	0	0
ANP-BELLINGHAM	580	300	ANP-BLACKSTONE	580	178	EMI-TIVERTON	281	13
MILLENNIUM	390	93	IDC-BELLINGHAM	0	0	MILFORD_PWR-CT	153	80

	INTERFACE FLOWS
NB-NE	700 700 -36 MEYANKEE-SOUTH 1350 321 -63 MAINE-NH 1400 1249 -41
NNE-SCOBIE+394	2550 2337 178 SEABROOK-SOUTH 1400 1375 214 81 81 27*
CMFD/MOORE-50	920 162 -8 SNDYPOND-SOUTH 4000 2266 119 CONN_EXPORT 2100 -1765 110
CONN-MASS	*** -671 144 CONN-RI *** -833 21 SW CONN_IMPORT 1700 2161 -11
BOSTON IMPORT	2600 3675 -4 NEMA/BOS_IMPORT 3200 4207 47 SEMA/RI_EXPORT 1900 2808 67
SEMA EXPORT	1400 792 -185 GREATER RI_EXP *** 2021 195 CONVEX-REMVEC *** -2014 140
EAST-WEST	2000 (2200) 2404 115 NY-NE 2200 (1700) 22 -34 PV-20 *** 87 ~6

HVDC TRANSFERS FROM H-Q

CHAT-1 = 0
MADAWASK = 150

CHAT-2 = 0
PHII-P1 = 1000

HIGHGATE = 215
PHII-P2 = 1000

BUS VOLTAGES

	V	LMT		V	LMT		V	LMT		
70001 CHESTER	345	340.	70002 ORRINGTON	345	344.	70027 ORRINGTON	115	116.		
70003 MAXCYS	345	348.	70170 BOWMAN	115	121.	70003 MAXCYS	345	348.		
70120 MAXCYS	115	123.	70512 ESX B-2	115	115.	70086 ME YANK	345	349.		
70087 SUROWIEC	345	350	70090 BUXTON	345	352	72692 NWGTN345	345	357.		
72694 SEBRK345	345	357	70487 COOL	345	345	71789 TEWKS	345	357.		
70759 MYSTIC	345	360	71797 MILLBURY	345	355.	72925 LUDLOW	345	346.		
72926 NRTHEFLD	345	352	73106 SOUTHGTN	345	351.	73105 CARD	345	352.		
73109 MONTVILLE	345	357.	73110 MILLSTNE	345	357.	73116 MIDLITWN	345	357.		
71801 BRAYTN P	345	358.	71811 KENT' CO.	345	353.	71336 SHERMAN	345	355.		
71338 OS POWER	345	355.	71337 WFARNUM	345	355.	70772 W MEDWAY	345	357.		
70780 WWALP345	345	355.	70783 PILGRIM	345	359.	70773 NEA 336	345	358.		
71193 CANAL	345	359.	71133 CARVER	345	357.	70795 FRMNGHAM	230	235.		
70818 MYSTC MA	115	120.	70900 HOLBROOK	115	118.	70901 EDGAR	115	119.		
71891 SALEM HR	115	117.	72096 MILLBURY	115	112.	0.0	71377 SOMERSET	115	117.	
72277 MIDWEYMT	115	118.	71403 WFARNUM	115	117.	72584 HARTAVE	115	119.		
72544 JOHNSTNL	115	119.	0.0	72545 JOHNSTM2	115	119.	0.0	72560 DRUMROCK	115	117.
72565 KENT CO	115	117.	0.0	72572 W.KINGST	115	113.	0.0			0.0
AREA/ZONE TOTALS										
NEPOOL_GEN	24720	NEPOOL_LOAD	26961	NEPOOL_LOSS	751	NEPOOL_INT	-3000			

D2.2006. T&D CAPS, NO UPGRADES. MYS456,BLK9,SH4, NEW BOS OFF
MYS7&8,KEND,SH1-3 ON. BI=3819.EW2393.NS2597.SRIEX2975.28.1GW

GENERATION																			
	V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX
73562	MILL#2	0.999	862	862	168	73563	MILL#3	0.995	1146	1146	168	73555	MIDDTN#2	1.027	117	117	54*		
73556	MIDDTN#3	1.004	233	233	80	73557	MIDDTN#4	1.024	400	400	200*	73558	MONTV#5	1.005	81	81	27*		
73559	MONTV#6	1.014	402	402	182	73551	NORHAR#1	0.986	162	162	9	73552	NORHAR#2	0.987	168	168	9		
73646	BPTHBR#1	0.000	0	0	0	73647	BPTHBR#2	1.009	170	170	115*	73648	BPTHBR#3	0.995	375	375	135		
73549	SMD1112J	0.000	93	0	0	73550	SMD1314J	0.000	93	0	0	72665	COLFAX	1.010	75	75	-8		
73594	WALL_LV1	0.000	102	0	0	73595	WALL_LV2	0.000	102	0	0	73596	WALL_LV3	0.000	51	0	0		
73651	NH HARBR	0.987	447	447	175*	73553	DEVON#7	1.019	107	107	47*	73554	DEVON#8	1.015	107	107	47*		
73574	MILFD#1	0.000	305	0	0	73575	MILFD#2	0	305	0	0	73579	TOW_ST1	0.000	188	0	0		
73580	TOW_GT1	0.000	181	0	0	73581	TOW_GT2	0.000	181	0	0	73588	MERIDEN1	1.063	305	305	165*		
73589	MERIDEN2	1.063	305	305	165*	73565	LAKERD#1	0.000	310	0	0	73566	LAKERD#2	0.000	310	0	0		
73567	LAKERD#3	0.000	310	0	0	72986	BERKPPWR	0.000	305	0	0	73085	MT.TOM	0.000	146	0	0		
72372	BP #1 GN	0.000	241	0	0	73588	MERIDEN1	1.063	305	305	165*	73589	MERIDEN2	1.063	305	305	165*		
72375	BP #2 GN	1.023	241	241	117*	72370	BP #3 GN	1.021	605	605	77	72371	BP #4 GN	1.024	425	425	58		
72661	MANCH09A	1.009	119	119	28	72662	MANCH10A	1.009	119	119	28	72663	MANCH11A	1.009	119	119	28		
72666	FRSQ_SC1	0.000	46	0	0	72667	FRSQ_SC2	0.992	46	46	-5	72668	FRSQ_SC3	0.000	46	0	0		
71521	SOM_G5	0.999	69	69	0	71522	SOM_G6	0.944	105	105	0	71531	OSPI	PF 1.013	77	77	9		
71532	OSP2	PF 1.013	77	77	9	71533	OSP3	PF 1.013	108	108	12	71534	OSP4	PF 1.013	77	77	9		
71535	OSP5	PF 1.013	77	77	9	71536	OSP6	PF 1.013	108	108	12	72671	HOPE_G1	1.074	180	180	66		
72672	HOPE_G2	1.070	180	180	66	72673	HOPE_G3	1.074	185	185	66	73652	BE_11	0.000	170	0	0		
73653	BE_12	0.000	170	0	0	73654	BE_10_ST	0.000	180	0	0	71084	NEA_GTPF	1.049	111	111	40*		
71085	NEA_GTPF	1.049	110	110	40*	71086	NEA_STPF	1.065	80	80	55*	71095	ANPBLCKL1	1.079	290	290	107		
/1096	ANPBLCK2	1.079	290	290	107	72373	MPLP_1PF	1.023	109	109	53*	72374	MPLP_2PF	1.005	45	45	27*		
72377	BELL #1	1.096	290	290	150*	72378	BELL #2	1.096	290	290	150*	71394	DIGHTON	0.973	185	185	4		
71719	POTTER	1.030	89	89	-10	71743	TAU_9A	8	1.053	55	55	28	71744	TAUNT_G9	1.049	85	85	52*	
70909	EDGR-GT1	1.035	215	215	17	70910	EDGR-GT2	1.035	215	215	17	70911	EDGR-ST1	1.035	276	276	23		
73069	MAPR1	PF 1.000	106	0	0	73070	MAPR2	PF 0.000	106	0	0	73071	MAPR3	PF 0.000	95	0	0		
72669	TIVER_G1	1.021	189	189	14	72670	TIVER_G2	1.023	92	92	7	71251	CANAL_G1	1.036	566	567	239*		
71252	CANAL_G2	1.015	576	580	120*	71094	PLGRM_G1	1.038	734	734	169	70825	MYS-ST11	0.000	215	0	0		
70826	MYS-GT12	0.000	215	0	0	70827	MYS-ST13	0.000	310	0	0	70822	MYS-ST10	1.063	276	276	65		
70823	MYST-GT9	1.064	215	215	65	70824	MYST-GT8	1.064	215	215	65	71060	MYST_G4	0.000	133	0	0		
71061	MYST_G5	0.000	129	0	0	71062	MYST_G6	0.000	136	0	0	71063	MYST_G7	1.043	565	565	295		
71074	N.BOST_2	0.000	380	0	0	71946	SALEM_G1	1.022	81	81	32*	71947	SALEM_G2	1.020	78	78	29*		
71948	SALEM_G3	1.017	143	143	50*	71949	SALEM_G4	0.000	400	0	0	71126	KEND_CT	1.035	187	187	32		
71123	KENDALL	1.009	63	63	32*	71124	KND_JETS	1.012	40	20	3	71185	TEWK-CT3	0.000	215	0	0		
91786	TEWK-CT2	0.000	215	0	0	91787	TEWK-CT1	0.000	215	0	0	91814	AES-CT1	1.044	280	279	50		
91815	AES-CT2	1.043	280	279	47	91816	AES-ST	1.036	280	280	32	91972	LOWELL	0.000	98	0	0		
73072	ALT12	PF 1.030	65	65	19	73073	ALT34	PF 1.029	81	81	19	71945	RESCO	1.040	33	33	20*		
/0010	CONED-G1	1.009	169	169	57	70011	CONED-G2	1.009	169	169	57	70012	CONED-G3	1.006	195	195	57		
72869	SBRK_G1	1.019	1150	1150	421	72868	NWNGT_G1	0.000	422	0	0	72870	SCHILLER	0.000	50	0	0		
72871	SCHILLER	0	986	50	25*	72872	SCHILLER	0.986	50	50	25*	72866	MERM_G1	1.043	113	113	36		
72867	MERMK_G2	1.043	320	320	103	70365	WF_WY #1	1.011	57	57	6	70366	WF_WY #2	1.011	57	57	6		
70367	WF_WY #3	1.011	125	125	12	70368	WF_WY #4	1.059	636	636	242*	70377	AEC_G1	1.040	58	58	7		
70378	AEC_G2	1.040	58	58	7	70379	AEC_G3	1.040	58	58	7	70381	RPA_CG1	1.040	179	179	40		
70382	RPA_SG2	1.040	94	94	15	70060	MIS_GT1	0.000	179	0	0	70061	MIS_GT2	0.000	179	0	0		
70062	MIS_ST	0.000	191	0	0	70389	BUCKS_G4	1.040	191	191	85	70705	VTYAK_G	0.972	563	563	150*		
70386	WBK_G1	1.040	185	185	32	70387	WBK_G2	1.040	185	185	32	70388	WBK_G3	1.040	196	196	34		
73083	NRTHFD12	0.993	540	270	80	73084	NRTHFD34	0.000	540	0	0	72512	BRSWP_G1	0.996	294	294	76		
72513	BRSWP_G2	0.000	294	0	0	72243	MILLENCNT	1.019	273	273	70	72244	MILLENST	1.015	117	117	31		

	MW	MX			MW	MX			MW	MX
MILLSSTONE	2008	337	MIDDLETOWN	750	334	MONTVILLE	483	209		
NORWALK_HARBOR	330	17	NEW_HAVEN_HBR	447	175	BRIDGEPORT_HBR	545	250		
S_MEADOW_CRRA-C	77	0	WALLINGFORD	0	0	TOWANTIC	0	0		
DEVON	214	94	BRAYTON_POINT	1271	252	MANCHESTER_ST	403	78		
SOMERSET	174	0	OCEAN_STATE_PWR	523	62	BE-CT	0	0		
HOPE_ENERGY	545	199	NEA-BELLINGHAM	301	135	CANAL	1167	359		
SITHE-MYSTIC345	706	194	MYSTIC_465&6	0	0	SITHE-MYSTIC115	0	0		
KENDALL_13_8	83	35	KENDALL_REPOWER	187	32	GE-ALT1	146	38		
SITHE-EDGAR	706	56	POTTER-MA	89	-10	TAUNTON-MA	140	80		
SALEM_HARBOR	302	111	ANDROSCOGGIN_EC	173	21	RPA	273	55		
WESTBROOK-ME	565	97	M_I.S.-ME	0	0	NU-NEWINGTON	0	0		
CONED-NEWINGTON	533	171	COMFORD-NH	133	2	MOORE-NH	139	27		
SCHILLER-NH	100	50	MERRIMACK-NH	433	139	AES-LONDONDERRY	837	129		
UAE-TEWKSBURY	0	0	WYMAN	875	267	BEAR_SWAMP	294	76		
NORTFIELD	270	80	STONY_BROOK	412	106	MASS_POWER	0	0		
ANP-BELLINGHAM	580	300	ANP-BLACKSTONE	580	213	EMI-TIVERTON	281	21		
MILLENNIUM	390	102	IDC-BELLINGHAM	0	0	MILFORD_PWR-CT	153	80		

	INTERFACE FLOWS
NB-NE	700 700 -36
NNE-SCOBIE+194	2550 2331 191
CMD/MOORE-SO	920 160 -5
CONN-MASS	*** -641 144
BOSTON IMPORT	2600 3819 24
SEMA EXPORT	1400 928 -195
EAST-WEST	2000 (2200) 2393 101
	NY-NE 2200(1700) 5 -29
	PV-20 *** 87 -6
	MAINE-NH 1400 1250 -40
	NORTH-SOUTH 3000 2597 38
	CONN EXPORT 2100 -1714 108
	SW CONN IMPORT 1700 2172 -6
	SEMA/RI EXPORT 1900 2975 77
	CONVEX-REMVEC **** -1989 153
	EMI-TIVERTON 281 21
	MILFORD_PWR-CT 153 80

HVDC TRANSFERS FROM H-Q
~~~~~  
CHAT-1 = 0  
MADAWASK = 150  
CHAT-2 = 0  
PHII-P1 = 1000  
HIGHGATE = 215  
PHII-P2 = 1000

| BUS VOLTAGES    |       |             |                  |             |       |
|-----------------|-------|-------------|------------------|-------------|-------|
| ~~~~~           |       |             | ~~~~~            |             |       |
|                 | V     | LMT         |                  | V           | LMT   |
| 70001 CHESTER   | 345   | 340.        | 70002 ORRINGTON  | 345         | 344.  |
| 70003 MAXCYS    | 345   | 348.        | 70170 BOWMAN     | 115         | 121.  |
| 70120 MAXCYS    | 115   | 123. H      | 70512 ESX B-2    | 115         | 115 L |
| 70087 SUROWIEC  | 345   | 350.        | 70090 BUXTON     | 345         | 352.  |
| 72694 SEBRK345  | 345   | 357.        | 70487 COOL 345   | 345         | 353.  |
| 70759 MYSTIC    | 345   | 360.        | 71797 MILLBURY   | 345         | 355.  |
| 72926 NRTHEFLD  | 345   | 352.        | 73105 SOUTHGTN   | 345         | 351.  |
| 73109 MONTVILLE | 345   | 357.        | 73110 MILLSTNE   | 345         | 357.  |
| 71801 BRAYTN P  | 345   | 358.        | 71811 KENT CO.   | 345         | 353.  |
| 71338 OS POWER  | 345   | 355.        | 71337 WFARNUM    | 345         | 354.  |
| 70780 WWALP345  | 345   | 355.        | 70783 PILGRIM    | 345         | 358.  |
| 71193 CANAL     | 345   | 358.        | 71133 CARVER     | 345         | 356.  |
| 70818 MYSTC MA  | 115   | 119.        | 70900 HOLBROOK   | 115         | 118.  |
| 71891 SALEM HR  | 115   | 117.        | 72096 MILLBURY   | 115         | 111.  |
| 72277 MIDWEYMT  | 115   | 118.        | 71403 WFARNUM    | 115         | 116.  |
| 72544 JOHNSTN1  | 115   | 119.        | 72545 JOHNSTN2   | 115         | 119.  |
| 72565 KENT CO   | 115   | 117.        | 72572 W.KINGST   | 115         | 113.  |
|                 | 0 0   |             |                  | 0.0         |       |
|                 | 0 0   |             |                  | 0.0         |       |
|                 |       |             | AREA/ZONE TOTALS |             |       |
|                 |       |             |                  |             |       |
| NEPOOL_GEN      | 25130 | NEPOOL_LOAD | 27333            | NEPOOL_LOSS | 773   |
|                 |       |             |                  | NEPOOL_INT  | -2984 |

D2.2007. T&D CAPS.NO UPGRADES. MYS456,BLK9,SH4,NEW BOS OFF.  
MYS7&8,KEND,SH1-3 ON.BI=3941.EW2403.NS2894.SRIEX2791. 28.6GW

| GENERATION      |            |       |       |      |      |                 |            |       |       |      |      |       |                 |        |       |     |      |    |
|-----------------|------------|-------|-------|------|------|-----------------|------------|-------|-------|------|------|-------|-----------------|--------|-------|-----|------|----|
|                 | V          | MAX   | MW    | MX   |      | V               | MAX        | MW    | MX    |      | V    | MAX   | MW              | MX     |       |     |      |    |
| 73562           | MILL#2     | 1.004 | 862   | 862  | 209  | 73563           | MILL#3     | 0.999 | 1146  | 1146 | 209  | 73555 | MIDDTN#2        | 0.987  | 117   | 117 | 54*  |    |
| 73556           | MIDDTN#3   | 0.000 | 233   | 0    | 0    | 73557           | MIDDTN#4   | 1.019 | 400   | 400  | 200* | 73558 | MONTV#5         | 1.006  | 81    | 81  | 27*  |    |
| 73559           | MONTV#6    | 1.018 | 402   | 402  | 200* | 73551           | NORHAR#1   | 0.987 | 162   | 162  | 10   | 73552 | NORHAR#2        | 0.987  | 168   | 168 | 10   |    |
| 73646           | BPTHBR#1   | 0.000 | 0     | 0    | 0    | 73647           | BPTHBR#2   | 1.009 | 170   | 170  | 115* | 73648 | BPTHBR#3        | 1.006  | 375   | 375 | 180  |    |
| 73549           | SMD1112J   | 0.000 | 93    | 0    | 0    | 73553           | SMD1314J   | 0.000 | 93    | 0    | 0    | 72665 | COLFAX          | 1.010  | 75    | 75  | -7   |    |
| 73594           | WALL_LV1   | 0.000 | 102   | 0    | 0    | 73595           | WALL_LV2   | 0.000 | 102   | 0    | 0    | 73596 | WALL_LV3        | 0.000  | 51    | 0   | 0    |    |
| 73651           | NH_HARBR   | 0.979 | 447   | 447  | 175* | 73553           | DEVON#7    | 1.016 | 107   | 107  | 47*  | 73554 | DEVON#8         | 1.012  | 107   | 107 | 47*  |    |
| 73574           | MILFD#1    | 0.000 | 305   | 0    | 0    | 73575           | MILFD#2    | 0.000 | 305   | 0    | 0    | 73579 | TOW_ST1         | 0.000  | 188   | 0   | 0    |    |
| 73580           | TOW_GT1    | 0.000 | 181   | 0    | 0    | 73581           | TOW_GT2    | 0.000 | 181   | 0    | 0    | 73588 | MERIDEN1        | 1.058  | 305   | 305 | 165* |    |
| 73589           | MERIDEN2   | 1.058 | 305   | 305  | 165* | 73565           | LAKERD#1   | 0.000 | 310   | 0    | 0    | 73566 | LAKERD#2        | 0.000  | 310   | 0   | 0    |    |
| 73567           | LAKERD#3   | 0.000 | 310   | 0    | 0    | 72986           | BERKPWR    | 1.059 | 305   | 305  | 92   | 73085 | MT_TOM          | 0.000  | 146   | 0   | 0    |    |
| 72372           | BP #1 GN   | 0.000 | 241   | 0    | 0    | 73588           | MERIDEN1   | 1.058 | 305   | 305  | 165* | 73589 | MERIDEN2        | 1.058  | 305   | 305 | 165* |    |
| 72375           | BP #2 GN   | 1.022 | 241   | 241  | 117* | 72370           | BP #3 GN   | 1.023 | 605   | 605  | 89   | 72371 | BP #4 GN        | 1.026  | 425   | 425 | 67   |    |
| 72661           | MANCH09A   | 1.010 | 119   | 119  | 35*  | 72662           | MANCH10A   | 0.000 | 119   | 0    | 0    | 72663 | MANCH11A        | 0.000  | 119   | 0   | 0    |    |
| 72666           | FRSQ_SC1   | 0.000 | 46    | 0    | 0    | 72667           | FRSQ_SC2   | 0.991 | 46    | 46   | -2   | 72668 | FRSQ_SC3        | 0.991  | 46    | 46  | -3   |    |
| 71521           | SOM_G5     | 0.998 | 69    | 69   | 0    | 71522           | SOM_G6     | 0.944 | 105   | 105  | 0    | 71531 | OSPI_PP         | 1.018  | 77    | 77  | 13   |    |
| 71532           | OSP2_PP    | 1.018 | 77    | 77   | 13   | 71533           | OSP3_PP    | 1.018 | 108   | 108  | 17   | 71534 | OSP4_PP         | 1.018  | 77    | 77  | 13   |    |
| 71535           | OSP5_PP    | 1.018 | 77    | 77   | 13   | 71536           | OSP6_PP    | 1.018 | 108   | 108  | 17   | 72671 | HOPE_G1         | 1.079  | 180   | 180 | 74   |    |
| 72672           | HOPE_G2    | 1.074 | 180   | 180  | 74   | 72673           | HOPE_G3    | 1.080 | 185   | 185  | 74   | 73652 | BE_11           | 0.000  | 170   | 0   | 0    |    |
| 73653           | BE_12      | 0.000 | 170   | 0    | 0    | 73654           | BE_10_ST   | 0.000 | 180   | 0    | 0    | 71084 | NEA_GTPF        | 1.048  | 111   | 111 | 40*  |    |
| 71085           | NFA_GTPF   | 1.048 | 110   | 110  | 40*  | 71086           | NEA_STPF   | 1.065 | 80    | 80   | 55*  | 71095 | ANPBLCK1        | 1.088  | 290   | 290 | 125  |    |
| 71096           | ANPBLCK2   | 1.088 | 290   | 290  | 125  | 72373           | MPLP_1PF   | 1.019 | 109   | 109  | 53*  | 72374 | MPLP_2PF        | 1.001  | 45    | 45  | 27*  |    |
| 72377           | BELL #1    | 1.094 | 290   | 290  | 150* | 72378           | BELL #2    | 1.094 | 290   | 290  | 150* | 71394 | DIGHTON         | 0.974  | 185   | 185 | 5    |    |
| 71719           | POTTER     | 1.029 | 89    | 89   | -10  | 71743           | TAU_9A     | 1.069 | 55    | 55   | 33   | 71744 | TAUNTY_G9       | 1.049  | 85    | 85  | 52*  |    |
| 70909           | EDGR-GT1   | 1.035 | 215   | 215  | 19   | 70910           | EDGR-GT2   | 1.035 | 215   | 215  | 19   | 70911 | EDGR-ST1        | 1.035  | 276   | 276 | 25   |    |
| 73069           | MAPR1_PP   | 0.000 | 106   | 0    | 0    | 73070           | MAPR2_PP   | 0.000 | 106   | 0    | 0    | 73071 | MAPR3_PP        | 0.000  | 95    | 0   | 0    |    |
| 72669           | TIVER_G1   | 1.021 | 189   | 189  | 14   | 72670           | TIVER_G2   | 1.023 | 92    | 92   | 7    | 71251 | CANAL_G1        | 1.035  | 566   | 587 | 239* |    |
| 71252           | CANAL_G2   | 1.014 | 576   | 580  | 120* | 71094           | PLGRM_G1   | 1.038 | 734   | 734  | 175  | 70825 | MYS-GT11        | 0.000  | 215   | 0   | 0    |    |
| 70826           | MYS-GTL1   | 0.000 | 215   | 0    | 0    | 70827           | MYS-ST13   | 0.000 | 310   | 0    | 0    | 70822 | MYS-ST10        | 1.089  | 276   | 276 | 131  |    |
| 70823           | MYST-GT1   | 0.090 | 215   | 215  | 131  | 70824           | MYST-GT8   | 1.090 | 215   | 215  | 131  | 71060 | MYST_G4         | 0.000  | 133   | 0   | 0    |    |
| 71061           | MYST_G5    | 0.000 | 129   | 0    | 0    | 71062           | MYST_G6    | 0.000 | 136   | 0    | 0    | 71063 | MYST_G7         | 1.043  | 565   | 565 | 295  |    |
| 71074           | N_BOST_2   | 0.000 | 380   | 0    | 0    | 71946           | SALEM_G1   | 1.018 | 81    | 81   | 32*  | 71947 | SALEM_G2        | 1.017  | 78    | 78  | 29*  |    |
| 71948           | SALLM_G3   | 1.013 | 143   | 143  | 50*  | 71949           | SALEM_G4   | 0.000 | 400   | 0    | 0    | 71126 | KEND_CT         | 1.035  | 187   | 187 | 37   |    |
| 71123           | KENDALL    | 1.006 | 63    | 63   | 32*  | 71124           | KND_JETS   | 1.009 | 40    | 20   | 3    | 91785 | TEWK-CT3        | 0.000  | 215   | 0   | 0    |    |
| 91786           | TEWK-CT2   | 0.020 | 1150  | 1150 | 550* | 91787           | TEWK-CT1   | 0.000 | 215   | 0    | 0    | 91814 | AES-CT1         | 1.048  | 280   | 279 | 56   |    |
| 91815           | AES-CT2    | 1.046 | 280   | 279  | 54   | 91816           | AES-ST     | 1.043 | 280   | 280  | 45   | 91972 | LOWELL          | 0.000  | 98    | 0   | 0    |    |
| 73072           | ALT1_PP    | 1.034 | 65    | 65   | 22   | 73073           | ALT34_PP   | 1.033 | 81    | 81   | 22   | 71945 | RESCO           | 1.036  | 33    | 33  | 20*  |    |
| 70010           | CONED-G1   | 1.016 | 169   | 169  | 74   | 70011           | CONED-G2   | 1.016 | 169   | 169  | 74   | 70012 | CONED-G3        | 1.012  | 195   | 195 | 74   |    |
| 72869           | SBRK_G1    | 1.028 | 1150  | 1150 | 550* | 72868           | WNNGT_G1   | 0.999 | 422   | 422  | 74   | 72870 | SCHILLER        | 0.000  | 50    | 0   | 0    |    |
| 72871           | SCHILLER   | 0.000 | 50    | 0    | 0    | 72872           | SCHILLER   | 0.955 | 50    | 50   | 25*  | 72866 | MERM_G1         | 1.052  | 113   | 113 | 49   |    |
| 72867           | MLRMK_G2   | 1.052 | 320   | 320  | 138  | 70365           | WF_WY      | 1.021 | 57    | 57   | 12   | 70366 | WF_WY           | #2     | 0.000 | 57  | 0    | 0  |
| 70361           | WF_WY      | #3    | 1.019 | 125  | 125  | 24              | 70368      | WF_WY | 1.045 | 636  | 636  | 242*  | 70377           | AEC_G1 | 1.040 | 58  | 58   | 10 |
| 70318           | AEC_G2     | 1.040 | 58    | 58   | 10   | 70379           | AEC_G3     | 1.040 | 58    | 58   | 10   | 70381 | RPA_CG1         | 0.000  | 179   | 0   | 0    |    |
| 70382           | RPA_SG2    | 0.000 | 94    | 0    | 0    | 70060           | MIS_GT1    | 1.078 | 179   | 179  | 81   | 70061 | MIS_GT2         | 1.078  | 179   | 179 | 81   |    |
| 70062           | MIS_ST     | 1.077 | 191   | 191  | 81   | 70389           | BUCKS_G4   | 1.040 | 191   | 191  | 58   | 70705 | VTYAK_G         | 0.964  | 563   | 563 | 150* |    |
| 70386           | WBK_G1     | 1.040 | 185   | 185  | 40   | 70387           | WBK_G2     | 1.040 | 185   | 185  | 40   | 70388 | WBK_G3          | 1.040  | 196   | 196 | 43   |    |
| 73083           | NRTNHFID12 | 0.989 | 540   | 270  | 80   | 73084           | NRTNHFID14 | 0.000 | 540   | 0    | 0    | 72512 | BRSPWP_G1       | 1.001  | 294   | 294 | 88   |    |
| 72513           | BRSPWP_G2  | 0.000 | 294   | 0    | 0    | 72243           | MILLENCNT  | 1.023 | 273   | 273  | 77   | 72244 | MILLENST        | 1.018  | 117   | 117 | 35   |    |
|                 | MW         | MX    |       |      |      |                 | MW         | MX    |       |      |      |       | MW              | MX     |       |     |      |    |
| MILLSTONE       | 2008       | 418   |       |      |      | MIDDLETOWN      | 517        | 254   |       |      |      |       | MONTVILLE       | 483    | 227   |     |      |    |
| NORWALK_HARBOR  | 330        | 19    |       |      |      | NEW_HAVEN_HBR   | 447        | 175   |       |      |      |       | BRIDGEPORT_HBR  | 545    | 295   |     |      |    |
| S_MEADOW_CRRA-C | 77         | 4     |       |      |      | WALLINGFORD     | 0          | 0     |       |      |      |       | TOWANTIC        | 0      | 0     |     |      |    |
| DEVON           | 214        | 94    |       |      |      | RAYTON_POINT    | 1271       | 273   |       |      |      |       | MANCHESTER_ST   | 211    | 30    |     |      |    |
| SOMERSET        | 174        | 0     |       |      |      | OCEAN_STATE_PWR | 523        | 86    |       |      |      |       | BE-CT           | 0      | 0     |     |      |    |
| HOPE_ENERGY     | 545        | 222   |       |      |      | NEA-BELLINGHAM  | 301        | 135   |       |      |      |       | CANAL           | 1167   | 359   |     |      |    |
| SITHE-MYSTIC345 | 706        | 394   |       |      |      | MYSTIC_4656     | 0          | 0     |       |      |      |       | SITHE-MYSTIC115 | 0      | 0     |     |      |    |
| KENDALL_13_8    | 83         | 35    |       |      |      | KENDALL_REPOWER | 187        | 37    |       |      |      |       | GE-ALT1         | 146    | 44    |     |      |    |
| SITHE-EDGAR     | 706        | 62    |       |      |      | POTTER-MA       | 89         | -10   |       |      |      |       | TAUNTON-MA      | 140    | 85    |     |      |    |
| SALEM_HARBOR    | 302        | 111   |       |      |      | ANDROSCOGGIN_EC | 173        | 30    |       |      |      |       | RPA             | 0      | 0     |     |      |    |
| WESTBROOK-ME    | 565        | 122   |       |      |      | M.I.S_-ME       | 549        | 242   |       |      |      |       | NU-NEWINGTON    | 422    | 74    |     |      |    |
| CONED-NEWINGTON | 533        | 222   |       |      |      | COMERFORD-NH    | 133        | 18    |       |      |      |       | MOORE-NH        | 139    | 31    |     |      |    |
| SCHILLER-NH     | 50         | 25    |       |      |      | MERIMACK-NH     | 433        | 187   |       |      |      |       | AES-LONDONDERRY | 837    | 155   |     |      |    |
| UAE-TEWKSBURY   | 0          | 0     |       |      |      | WYMAN           | 618        | 278   |       |      |      |       | BEAR_SWAMP      | 294    | 88    |     |      |    |
| NORTHFIELD      | 270        | 80    |       |      |      | STONY_BROOK     | 412        | 110   |       |      |      |       | MASS_POWER      | 0      | 0     |     |      |    |
| ANP-BELLINGHAM  | 580        | 300   |       |      |      | ANP-BLACKSTONE  | 580        | 251   |       |      |      |       | EMI-TIVERTON    | 281    | 21    |     |      |    |
| MILLENNIUM      | 390        | 112   |       |      |      | IDC-BELLINGHAM  | 0          | 0     |       |      |      |       | MILFORD_FWR-CT  | 153    | 80    |     |      |    |

#### INTERFACE FLOWS

| NB-NE          | 700        | 700  | -43  |  |  | MEYANKEE-SOUTH  | 1350       | 617  | -109 |  |  | MAINE-NH       | 1400 | 1326  | -59 |  |
|----------------|------------|------|------|--|--|-----------------|------------|------|------|--|--|----------------|------|-------|-----|--|
| NNE-SCOBIE+394 | 2550       | 2743 | 285  |  |  | SEABROOK-SOUTH  | 1400       | 1631 | 329  |  |  | NORTH-SOUTH    | 3000 | 2894  | 39  |  |
| CMFD/MOORE-SO  | 920        | 153  | 9    |  |  | SNDYPOND-SOUTH  | 4000       | 2362 | 40   |  |  | CONN_EXPORT    | 2100 | -1947 | 90  |  |
| CONN-MASS      | ****       | -832 | 147  |  |  | CONN-RI         | ****       | -830 | 14   |  |  | SW_CONN_IMPORT | 1700 | 2231  | 17  |  |
| BOSTON_IMPORT  | 2600       | 3941 | 50   |  |  | NEMA/BOS_IMPORT | 3200       | 4489 | 103  |  |  | SEMA/RI_EXPORT | 1900 | 2791  | 159 |  |
| SEMA_EXPORT    | 1400       | 914  | -186 |  |  | GREATER RI EXP  | ****       | 1883 | 296  |  |  | CONVEX-REMVEC  | **** | -1938 | 169 |  |
| EAST-WEST      | 2000(2200) | 2402 | 122  |  |  | NY-NE           | 2200(1700) | 34   | -2   |  |  | PV-20          | **** | 86    | -5  |  |

HVDC TRANSFERS FROM H-Q  
 ~~~~~  
 CHAT-1 = 0
 MADAWASK = 150
 CHAT-2 = 0
 PHII-P1 = 1000
 HIGHGATE = 215
 PHII-P2 = 1000

BUS VOLTAGES					
	V	LMT		V	LMT
70001 CHESTER	345	342.	70002 ORRINGTN	345	347.
70003 MAXCYS	345	341.	70170 BOWMAN	115	120.
70120 MAXCYS	115	122. H	70512 ESX B-2	115	114. L
70087 SUROWIEC	345	345.	70090 BUXTON	345	347.
72694 SEBRK345	345	357.	70487 COOL 345	345	349.
70759 MYSTIC	345	360.	71797 MILLBURY	345	354.
72926 NRTHFLD	345	350.	73106 SOUTHGTN	345	349.
73109 MONTVILLE	345	357.	73110 MILLSTNE	345	357.
71801 BRAYTN P	345	358.	71811 KENT CO.	345	353.
71338 OS POWER	345	355.	71337 WFARNUM	345	354.
70780 WWALP345	345	354.	70783 PILGRIN	345	358.
71193 CANAL	345	357	71133 CARVER	345	355.
70818 MYSTC MA	115	119	70900 HOLBROOK	115	117.
71891 SALEM HR	115	117	72096 MILLBURY	115	110.
72277 MIDWEYMT	115	118.	71403 WFARNUM	115	116.
72544 JOHNSTN1	115	119.	72545 JOHNSTN2	115	119.
72565 KENT CO	115	117.	72572 W.KINGST	115	113.
		0.0			0.0
		0.0			0.0
			AREA/ZONE TOTALS		
NEPOOL_GEN	25601	NEPOOL_LOAD	27788	NEPOOL_LOSS	820
				NEPOOL_INT	-3014

D2 2008. T&D CAPS.NO UPGRADES. MYS456,BLK#9,SH4,NEW BOS OFF.
MYS7&8,KEND,SH1-3 ON.BI=4042.EW2400.NS2865.SRIEX2936. 29.0GW

GENERATION																			
	V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX
73562	MILL#2	1.002	862	862	197	73563	MILL#3	0.998	1146	1146	197	73555	MIDDTN#2	1.027	117	117	54*		
73556	MIDDTN#3	1.005	233	233	84	73557	MIDDTN#4	1.021	400	400	200*	73558	MONTV#5	1.006	81	81	27*		
73559	MONTV#6	1.018	402	402	200*	73551	NORHAR#1	0.990	162	162	15	73552	NORHAR#2	0.990	168	168	15		
73646	BPTHBR#1	0.000	0	0	0	73647	BPTHBR#2	1.009	170	170	115*	73648	BPTHBR#3	1.009	375	375	194		
73549	SMD1112J	0.000	93	0	0	73550	SMD1314J	0.000	93	0	0	72665	COLFAX	1.010	75	75	-8		
73594	WALL_LV1	0.000	102	0	0	73595	WALL_LV2	0.000	102	0	0	73596	WALL_LV3	0.000	51	0	0		
73651	NH HARBR	0.981	447	447	175*	73553	DEVON#7	1.016	107	107	47*	73554	DEVON#8	1.012	107	107	47*		
73574	MILFD#1	0.000	305	0	0	73575	MILFD#2	0.000	305	0	0	73579	TOW_ST1	0.000	188	0	0		
73580	TOW_GT1	0.000	181	0	0	73581	TOW_GT2	0.000	181	0	0	73588	MERIDEN1	1.059	305	305	165*		
73589	MERIDEN2	1.059	305	305	165*	73565	LAKERD#1	0.000	310	0	0	73566	LAKERD#2	0.000	310	0	0		
73567	LAKERD#3	0.000	310	0	0	72986	BERKPWR	1.053	305	305	81	73085	MT.TOM	0.000	146	0	0		
72372	BP #1 GN	0.000	241	0	0	73588	MERIDEN1	1.059	305	305	165*	73589	MERIDEN2	1.059	305	305	165*		
J2375	BP #2 GN	1.021	241	241	117*	72370	BP #3 GN	1.023	605	605	92	72371	BP #4 GN	1.027	425	425	69		
72661	MANCHO9A	1.010	119	119	28	72662	MANCH10A	1.010	119	119	28	72663	MANCH11A	1.010	119	119	28		
72666	FRSQ SC1	0.000	46	0	0	72667	FRSQ SC2	0.992	46	46	-5	72668	FRSQ SC3	0.994	46	46	-5		
71521	SOM_G5	0.997	69	69	0	71522	SOM_G6	0.943	105	105	0	71531	OSPI	PF 1.015	77	77	11		
71532	OSP2	PF 1.015	77	77	11	71533	OSP3	PF 1.015	108	108	15	71534	OSP4	PF 1.015	77	77	11		
71535	OSP5	PF 1.015	77	77	11	71536	OSP6	PF 1.015	108	108	15	72671	HOPE_G1	1.076	180	180	69		
72672	HOPE_G2	1.072	180	180	69	72673	HOPE_G3	1.076	185	185	69	73652	BE_11	0.000	170	0	0		
73653	BE_12	0.000	170	0	0	73654	BE_10_ST	0.000	180	0	0	71084	NEA_GTPF	1.048	111	111	40*		
J1085	NFA_GTPF	1.048	110	110	40*	71086	NEA_STPF	1.065	80	80	55*	71095	ANPBLCK1	1.095	290	290	140		
71096	ANPBLCK2	1.095	290	290	140	72373	MPLP_1PF	1.013	109	109	53*	72374	MPLP_2PF	0.995	45	45	27*		
72371	BELL #1	1.093	290	290	150*	72378	BELL #2	1.093	290	290	150*	71394	DIGHTON	0.978	185	185	10		
71119	POTTER	1.027	89	89	-10	71743	TAU_9A,8	1.072	55	55	34*	71744	TAUNT_G9	1.048	85	85	52*		
70909	EDGR-GT1	1.035	215	215	22	70910	EDGR-GT2	1.035	215	215	22	70911	EDGR-ST1	1.035	276	276	28		
73069	MAPR1	PF 0.000	106	0	0	73070	MAPR2	PF 0.000	106	0	0	73071	MAPR3	PF 0.000	95	0	0		
72669	TIVER_G1	1.024	189	189	17	72670	TIVER_G2	1.025	92	92	9	71251	CANAL_G1	1.033	566	587	239*		
71252	CANAL_G2	1.012	576	580	120*	71094	PLGRM_G1	1.038	734	734	184	70825	MYS-ST11	0.000	215	0	0		
70826	MYS-GT12	0.000	215	0	0	70827	MYS-ST13	0.000	310	0	0	70822	MYS-ST10	1.102	276	276	167		
70823	MYST-GT9	1.103	215	215	167	70824	MYST-GT8	1.103	215	215	167	71060	MYST_G4	0.000	133	0	0		
71061	MYST_G5	0.000	129	0	0	71062	MYST_G6	0.000	136	0	0	71063	MYST_G7	1.043	565	565	295		
71074	N.BOST_2	0.000	380	0	0	71946	SALEM_G1	1.016	81	81	32*	71947	SALEM_G2	1.014	78	78	29*		
71948	SALEM_G3	1.011	143	143	50*	71949	SALEM_G4	0.000	400	0	0	71126	KEND_CT	1.035	187	187	41		
71123	KENDALL	0.999	63	63	32*	71124	KND_JETS	1.002	40	20	3	91785	TEWK-CT3	0.000	215	0	0		
91786	TEWK-CT2	0.000	215	0	0	91787	TEWK-CT1	0.000	215	0	0	91814	AES-CT1	1.050	280	279	60		
91815	AES-CT2	1.048	280	279	57	91816	AES-ST	1.041	280	280	42	91972	LOWELL	0.000	98	0	0		
73072	ALTL2	PF 1.035	65	65	23	73073	ALT34	PF 1.034	81	81	23	71945	RESCO	1.034	33	33	20*		
70010	CONED-G1	1.019	169	169	81	70011	CONED-G2	1.019	169	169	81	70012	CONED-G3	1.015	195	195	81		
72869	SHRR_G1	1.027	1150	1150	550*	72868	NWNCT_G1	1.001	422	422	81	72870	SCHILLER	0.000	50	0	0		
72871	SCHILLER	0.000	50	0	0	72872	SCHILLER	0.956	50	50	25*	72866	MERM_G1	1.052	113	113	49		
72867	MERM_G2	1.052	320	320	140	70365	WF_WY #1	1.021	57	57	12	70366	WF_WY #2	0.000	57	0	0		
70361	WF_WY #3	1.020	125	125	24	70368	WF_WY #4	1.044	636	636	242*	70377	AEC_G1	1.040	58	58	10		
70378	AEC_G2	1.040	58	58	10	70379	AEC_G3	1.040	58	58	10	70381	RPA_CG1	0.000	179	0	0		
70382	RPA_SG2	0.000	94	0	0	70060	MIS_GT1	1.078	179	179	81	70061	MIS_GT2	1.078	179	179	81		
70062	MIS_ST	1.077	191	191	81	70389	BUCKS_G4	1.040	191	191	58	70705	VTYAK_G	0.963	563	563	150*		
70386	WBK_G1	1.040	185	185	40	70387	WBK_G2	1.040	185	185	40	70388	WBK_G3	1.040	196	196	43		
73083	NRTHFD12	0.988	540	270	80	73084	NRTHFD34	0.000	540	0	0	72512	BRSPW_G1	1.004	294	294	95		
72513	BRSPW_G2	0.000	294	0	0	72243	MILLENC1	1.025	273	273	83	72244	MILLENST	1.020	117	117	37		

	MW	MX			MW	MX			MW	MX	
MILLSTONE	2008	394	MIDDLETOWN	750	338	MONTVILLE	483	227			
NORWALK_HARBOR	330	31	NEW_HAVEN_HBR	447	175	BRIDGEPORT_HBR	545	309			
S_MEADOW_CRRAC-C	77	0	WALLINGFORD	0	0	TOWANTIC	0	0			
DEVON	214	94	BRAYTON_POINT	1271	278	MANCHESTER_ST	449	75			
SOMERSET	174	0	OCEAN_STATE_PWR	523	73	BE-CT	0	0			
HOPE_ENERGY	545	208	NEA-BELLINGHAM	301	135	CANAL	1167	359			
SITHE-MYSTIC345	706	500	MYSTIC_465&6	0	0	SITHE-MYSTIC115	0	0			
KENDALL_13_8	83	35	KENDALL_REPOWER	187	41	GE-ALT1	146	46			
SITHE-EDGAR	706	72	POTTER-MA	89	-10	TAUNTON-MA	140	86			
SALEM_HARBOR	302	111	ANDROSOGGIN_EC	173	30	RPA	0	0			
WESTBROOK-ME	565	123	M.I.S.-ME	549	242	NU-NEWINGTON	422	81			
CONED-NEWINGTON	533	242	COMERFORD-NH	133	23	MOORE-NH	139	32			
SCHILLER-NH	50	25	MERRIMACK-NH	433	189	AES-LONDONDERRY	837	160			
UAE-TEWKSBURY	0	0	WYMAN	818	278	BEAR_SWAMP	294	95			
NORTHFIELD	270	80	STONY_BROOK	412	108	MASS_POWER	0	0			
BOSTON_IMPORT	2600	4042	NEMA/BOS_IMPORT	3200	4600	EMI-TIVERTON	281	26			
SEMA_EXPORT	1400	869	-183	GREATERR_EXP	****	2073	297	CONVEX-REMVEC	****	-1908	188
EAST-WEST	2000 (2200)	2400	NY-NE	2200 (1700)	-24	11	PV-20	****	89	-4	

HVDC TRANSFERS FROM H-Q

CHAT-1 = 0
MADAWASK = 150

CHAT-2 = 0
PHII-P1 = 1000

HIGHGATE = 215
PHII-P2 = 1000

BUS VOLTAGES

	V	LMT		V	LMT		V	LMT		
70001 CHESTER	345	342.	70002 ORRINGTN	345	347.	70027 ORRINGTN	115	120.		
70003 MAXCYS	345	341.	70170 BOWMAN	115	120	70003 MAXCYS	345	341.		
70120 MAXCYS	115	122. H	70512 ESX B-2	115	114. L	70086 ME YANK	345	343.		
70087 SUROWIEC	345	344.	70090 BUXTON	345	347.	72692 NWGTN345	345	357.		
72694 SEBRKJ45	345	356.	70487 COOL	345	348.	71789 TEWKS	345	355.		
70759 MYSTIC	345	360	71797 MILLBURY	345	354	72925 LUDLOW	345	346.		
72926 NRTHFLD	345	350.	73106 SOUTHGTN	345	349	73108 CARD	345	352.		
73109 MONTVILLE	345	357.	73110 MILLSTNE	345	357.	73116 MIDDITWN	345	356.		
71801 BRAYTN P	345	358.	71811 KENT CO.	345	353.	71336 SHERMAN	345	355.		
71338 OS POWER	345	355.	71337 WFARNUM	345	354.	70772 W MEDWAY	345	355.		
70780 WWALP345	345	354.	70783 PILGRIM	345	358.	70773 NEA 336	345	358.		
71193 CANAL	345	357.	71133 CARVER	345	355.	70795 FRMNGHAM	230	233.		
70818 MYSTC MA	115	118.	70900 HOLBROOK	115	117.	70901 EDGAR	115	118.		
71891 SALEM HR	115	116.	72096 MILLBURY	115	110.	0.0	71377 SOMERSET	115	116.	
72277 MIDWEYMT	115	118.	71403 WFARNUM	115	116.	72584 HARTAVE	115	119.		
72544 JOHNSTN1	115	119.	0.0	72545 JOHNSTN2	115	119.	0.0	72560 DRUMROCK	115	117.
72565 KENT CO	115	117.	0.0	72572 W.KINGST	115	112.	0.0			0.0
AREA/ZONE TOTALS										
NEPOOL_GEN	26072	NEPOOL_LOAD	28183	NEPOOL_LOSS	839	NEPOOL_INT	-2957			

APPENDIX B-2. CASE SUMMARIES: BLOCK 9 OFF, NEW BOSTON ON.

	2004	2005	2006	2007	2008					
NEPOOL Load	26,659	26,961	27,320	27,788	28,183					
NEPOOL Losses	735	741	761	809	825					
NEPOOL Load + Losses	27,394	27,702	28,081	28,597	29,008					
NSTAR-North MW	4,055	4,099	4,207	4,291	4,366					
NSTAR-North MVar	1,349	1,363	1,401	1,429	1,454					
NSTAR-North MVA	4,274	4,320	4,434	4,523	4,602					
Boston Import (MW)	3,234	3,317	3,477	3,582	3,682					
North-South (MW)	2,591	2,610	2,588	2,889	2,857					
East-West (MW)	2,395	2,417	2,420	2,416	2,416					
SEMA/RI Export (MW)	2,381	2,464	2,659	2,446	2,592					
	MW	MX	MW	MX	MW	MX	MW	MX	MW	MX
Mystic Units 4,5,6	0	0	0	0	0	0	0	0	0	0
Mystic Unit 7	565	109	565	73	565	90	565	138	565	130
Mystic Block 8	706	326	706	218	706	271	706	413	706	391
Mystic Block 9	0	0	0	0	0	0	0	0	0	0
New Boston	350	36	350	-46	350	-46	350	-46	350	220
Kendall CT 4	187	32	187	-68	187	-52	187	-14	187	-42
Salem Harbor	302	111	302	111	302	111	302	111	302	111

D2.2004. NO UPGRD. 75MVAR CAPS@496,292,483.MYS45649 OFF.NB ON
MYS7&8,SH1-3,KEND ON. B13234.EW2395.NS2591.SRIEX2381. 27.4GW

GENERATION																	
	V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX			
73562	MILL#2	0.998	862	862	158	73563	MILL#3	0.994	1146	1146	158	73555	MIDDTN#2	1.027	117	117	54*
73556	MIDDTN#3	1.002	233	233	77	73557	MIDDTN#4	1.025	400	400	200*	73558	MONTV#5	0.000	81	0	0
73559	MONTV#6	1.016	402	402	192	73551	NORHAR#1	0.987	162	162	9	73552	NORHAR#2	0.000	168	0	0
73646	BPTHBR#1	0.000	0	0	0	73647	BPTHBR#2	1.009	170	170	115*	73648	BPTHBR#3	0.994	375	375	128
73549	SMD1112J	0.000	93	0	0	73550	SMD1314J	0.000	93	0	0	72665	COLFAX	0.000	75	0	0
73594	WALL_LV1	0.000	102	0	0	73595	WALL_LV2	0.000	102	0	0	73596	WALL_LV3	0.000	51	0	0
73651	NH_HARBR	0.989	447	447	175*	73553	DEVON#7	1.019	107	107	47*	73554	DEVON#8	1.016	107	107	47*
73574	MILFD#1	0.000	305	0	0	73575	MILFD#2	0.000	305	0	0	73579	TOW_ST1	0.000	188	0	0
73580	TOW_GTI	0.000	181	0	0	73581	TOW_GT2	0.000	181	0	0	73588	MERIDEN1	1.056	305	305	146
73589	MERIDEN2	1.056	305	305	146	73565	LAKERD#1	0.000	310	0	0	73566	LAKERD#2	0.000	310	0	0
73567	LAKERD#3	0.000	310	0	0	72986	BERKPWR	0.000	305	0	0	73085	MT.TOM	0.000	146	0	0
72372	BP #1 GN	1.025	241	241	120*	73588	MERIDEN1	1.056	305	305	146	73589	MERIDEN2	1.056	305	305	146
72375	BP #2 GN	0.000	241	0	0	72370	BP #3 GN	1.021	605	605	77	72371	BP #4 GN	1.024	425	425	58
72661	MANCH09A	1.013	119	119	35*	72662	MANCH10A	0.000	119	0	0	72663	MANCH11A	1.013	119	119	35*
72666	FRSQ_SC1	0.994	46	-5	72667	FRSQ_SC2	0.000	46	0	0	72668	FRSQ_SC3	0.000	46	0	0	
71521	SOM_G5	0.000	69	0	0	71522	SOM_G6	0.000	105	0	0	71531	OSP1	PF 1.016	77	77	11
71532	OSP2	PF 1.016	77	77	11	71533	OSP3	PF 0.000	108	0	0	71534	OSP4	PF 1.016	77	77	11
71535	OSP5	PF 1.016	77	77	11	71536	OSP6	PF 1.015	108	108	15	72671	HOPE_G1	1.071	180	180	63
72672	HOPE_G2	1.068	180	180	63	72673	HOPE_G3	1.072	185	185	63	73652	BE_11	0.000	170	0	0
73653	BE_12	0.000	170	0	0	73654	BE_10_ST	0.000	180	0	0	71084	NEA_GTPF	1.049	111	111	40*
71085	NEA_GTPF	1.049	110	110	40*	71086	NEA_STPF	1.065	80	80	55*	71095	ANPBLCK1	1.079	290	290	107
71096	ANPBLCK2	1.079	290	290	107	72373	MPLP_1PF	1.024	109	109	53*	72374	MPLP_2PF	1.007	45	45	27*
72377	BELL_#1	1.096	290	290	150*	72378	BELL_#2	1.096	290	290	150*	71394	DIGHTON	0.000	185	0	0
71719	POTTER	1.033	89	89	-10	71743	TAU_9A,8	1.039	55	55	23	71744	TAUNT_G9	1.049	85	85	52*
70909	EDGR-GT1	1.039	215	215	20	70910	EDGR-GT2	1.039	215	215	20	70911	EDGR-ST1	1.037	276	276	20
73069	MAPR1	PF 0.000	106	0	0	73070	MAPR2	PF 0.000	106	0	0	73071	MAPR3	PF 0.000	95	0	0
72669	TIVER_G1	1.022	189	189	15	72670	TIVER_G2	1.023	92	92	8	72511	CANAL_G1	1.037	566	587	239*
71252	CANAL_G2	1.016	576	580	120*	71094	PLGRM_G1	1.038	734	734	164	70825	MYS-GT11	0.000	215	0	0
70826	MYS-GT12	0.000	215	0	0	70827	MYS-ST13	0.000	310	0	0	70822	MYS-ST10	1.031	276	276	47
70823	MYST-GT9	1.032	215	215	47	70824	MYST-GT8	1.032	215	215	47	71060	MYST_G4	0.000	133	0	0
71061	MYST_G5	0.000	129	0	0	71062	MYST_G6	0.000	136	0	0	71063	MYST_G7	1.043	565	565	294
71074	N_BOST_2	0.989	380	350	36	71946	SALEM_G1	1.024	81	81	32*	71947	SALEM_G2	1.023	78	78	29*
71948	SALEM_G3	1.019	143	143	50*	71949	SALEM_G4	0.000	400	0	0	71126	KEND_CT	1.035	187	187	32
71123	KENDALL	1.033	63	63	32*	71124	KND_JETS	1.033	40	20	0	91785	TEWK-CT3	0.000	215	0	0
91786	TLWK-CT2	0.000	215	0	0	91787	TEWK-CT1	0.000	215	0	0	91814	AES-CT1	1.043	280	279	47
91815	AES-CT2	1.041	280	279	44	91816	AES-ST	1.038	280	280	35	91972	LOWELL	0.000	98	0	0
73072	ALT12	PF 1.038	65	65	26	73073	ALT34	PF 1.037	81	81	26	71945	RESCO	1.042	33	33	20*
70010	CONED-G1	1.009	169	169	58	70011	CONED-G2	1.009	169	169	58	70012	CONED-G3	1.006	195	195	58
72869	SBRR_G1	1.019	1150	1150	413	72868	NWWNT_G1	0.000	422	0	0	72870	SCHILLER	0.000	50	0	0
72871	SCHILLER	0.000	50	0	0	72872	SCHILLER	0.000	50	0	0	72866	MERM_G1	1.040	113	113	33
72867	MERM_G2	1.040	320	320	94	70365	WF_WY_#1	1.011	57	57	6	70366	WF_WY_#2	1.011	57	57	6
70361	WE_WY_#3	1.011	125	125	13	70368	WF_WY_#4	1.061	636	636	242*	70377	AEC_G1	1.040	58	58	6
70378	AEC_G2	0.000	58	0	0	70379	AEC_G3	1.040	58	58	6	70381	RPA_CG1	1.040	179	179	36
70382	RPA_SG2	1.040	94	94	13	70060	MIS_GT1	0.000	179	0	0	70061	MIS_GT2	0 000	179	0	0
70062	MIS_ST	0.000	191	0	0	70389	BUCKS_G4	1.040	191	191	79	70705	VTYAK_G	0.970	563	563	150*
70386	WBK_G1	1.040	185	185	32	70387	WBK_G2	1.040	185	185	32	70388	WBK_G3	1.040	196	196	35
73083	NRTNFD12	0.991	540	270	80	73084	NRTNFD34	0.000	540	0	0	72512	BRSPW_G1	0.994	294	294	73
72513	BRSPW_G2	0.000	294	0	0	72243	MILLENC1	1.018	273	273	69	72244	MILLENST	1.015	117	117	31

	MW	MX		MW	MX		MW	MX
MILLSTONE	2008	317	MIDDLETOWN	750	331	MONTVILLE	402	192
NORWALK_HARBOR	162	9	NEW_HAVEN_HBR	447	175	BRIDGEPORT_HBR	545	243
S_MEADOW_CRRA-C	77	0	WALLINGFORD	0	0	TOWANTIC	0	0
DEVON	214	94	BRAYTON_POINT	1271	254	MANCHESTER_ST	284	65
SOMLSET	0	0	OCEAN_STATE_PWR	416	59	BE-CT	0	0
HOPE_ENERGY	545	188	NEA-BELLINGHAM	301	135	CANAL	1167	359
SITHE-MYSTIC345	706	140	MYSTIC_4&5&6	0	0	SITHE-MYSTIC115	0	0
KENDALL_13..8	83	32	KENDALL_REPOWER	187	32	GE-ALT1	146	52
SITHE-EDGAR	706	59	POTTER-MA	89	-10	TAUNTON-MA	140	75
SALEM_HARBOR	302	111	ANDROSCOGGIN_EC	115	13	RPA	273	49
WESTBROOK-ME	565	100	M.I.S.-ME	0	0	NU-NEWINGTON	0	0
CONFED-NEWINGTON	533	175	COMERFORD-NH	133	0	MOORE-NH	139	21
SCHILLER-NH	0	0	MERRIMACK-NH	433	127	AES-LONDONDERRY	837	126
UAE-TEWKSURY	0	0	WYMAN	875	268	BEAR_SWAMP	294	73
NORTHFIELD	270	80	STONY_BROOK	412	108	MASS_POWER	0	0
ANP-BELLINGHAM	580	300	ANP-BLACKSTONE	580	213	EMI-TIVERTON	281	22
MILLENNIUM	390	100	IDC-BELLINGHAM	0	0	MILFORD_PWR-CT	153	80

	INTERFACE FLOWS										
NB-NE	700	700	-43	MEYANKEE-SOUTH	1350	325	-57	MAINE-NH	1400	1250	-6
NNE-SCOBIE+394	2550	2312	203	SEABROOK-SOUTH	1400	1355	222	NORTH-SOUTH	3000	2591	41
CMFD/MOORE-50	920	165	-10	SNDYPOND-SOUTH	4000	2264	1	CONN_EXPORT	2100	-1797	139
CONN-MASS	***	-707	166	CONN-RI	****	-796	26	SW_CONN_IMPORT	1700	2250	-29
BOSTON_IMPORT	2600	3234	27	NEMA/BOS_IMPORT	3200	3755	66	SEMA/RI_EXPORT	1900	2381	186
SEMA_EXPORT	1400	607	-145	GREATER RI_EXP	****	1777	268	CONVEX-REMVEC	****	-2024	149
EAST-WEST	2000 (2200)	2395	89	NY-NE	2200 (1700)	8	-53	PV-20	****	82	-6

HVDC TRANSFERS FROM H-Q

CHAT-1 = 0	CHAT-2 = 0	HIGHGATE = 215
MADAWASK = 150	PHII-P1 = 1000	PHII-P2 = 1000

BUS VOLTAGES

V LMT	V LMT	V LMT
70001 CHESTER 345 341.	70002 ORRINGTON 345 346.	70027 ORRINGTON 115 117.
70003 MAXCYS 345 349.	70170 BOWMAN 115 121. H	70003 MAXCYS 345 349
70120 MAXCYS 115 123. H	70512 ESX B-2 115 115. L	70086 ME YANK 345 351.
70087 SUROWIEC 345 352.	70090 BUXTON 345 353.	72692 NWGTN345 345 357.
72694 SEBRK345 345 357.	70487 COOL 345 345 353.	71789 TEWKS 345 357.
70759 MYSTIC 345 360	71797 MILLBURY 345 354	72925 LUDLOW 345 346.
72926 NRTHEFLD 345 351	73106 SOUTHGTN 345 351.	73108 CARD 345 353.
73109 MONTVILLE 345 357.	73110 MILLSTNE 345 357.	73116 MIDLITWN 345 357.
71801 BRAYTN P 345 358.	71811 KENT CO. 345 353.	71336 SHERMAN 345 355.
71338 OS POWER 345 355	71337 WFARNUM 345 354.	70772 W MEDWAY 345 356.
70780 WWALP345 345 355.	70783 PILGRIM 345 359.	70773 NEA 336 345 358.
71193 CANAL 345 358.	71133 CARVER 345 356.	70795 FRMNGHAM 230 234.
70818 MYSTC MA 115 119.	70900 HOLBROOK 115 118.	70901 EDGAR 115 119.
/1891 SALEM HR 115 117.	72096 MILLBURY 115 111.	0.0 71377 SOMERSET 115 116.
72277 MIDWEYMT 115 118.	71403 WFARNUM 115 117.	72584 HARTAVE 115 119
72544 JOHNSTM1 115 119.	0.0 72545 JOHNSTM2 115 119.	0.0 72560 DRUMROCK 115 117 0.0
/2565 KENT CO 115 117.	0.0 72572 W.KINGST 115 113.	0.0

AREA/ZONE TOTALS

NEPOOL_GEN 24418	NEPOOL_LOAD 26659	NEPOOL_LOSS 735
NEPOOL_INT -2984		

D2.2005. T&D CAPS, NO UPGRADES. MYS456,BLK9,SH4 OFF. NB#350.
MYS768,KEND,SH1-3 ON.BI=3317.EW2417.NS2610.SRIEX2464. 27.7GW

GENERATION																				
	V	MAX	MW	MX		V	MAX	MW	MX		V	MAX	MW	MX						
73562	MILL#2	1.000	862	862	171	73563	MILL#3	0.995	1146	1146	171	73555	MIDDTN#2	0.000	117	0	0			
73556	MIDDTN#3	0.989	233	233	87*	73557	MIDDTN#4	1.024	400	400	200*	73558	MONTV#5	1.005	81	81	27*			
73559	MONTV#6	1.014	402	402	180	73551	NORHAR#1	0.985	162	162	6	73552	NORHAR#2	0.985	168	168	6			
73646	BPTHBR#1	0.000	0	0	0	73647	BPTHBR#2	1.009	170	170	115*	73648	BPTHBR#3	0.992	375	375	122			
73549	SMD1112J	0 000	93	0	0	73550	SMD1314J	0 000	93	0	0	72665	COLFAX	1.010	75	75	-9			
73594	WALL	LVL 1	0.000	102	0	0	73595	WALL	LVL 2	0.000	102	0	0	73596	WALL	LVL 3	0.000	51	0	0
73651	NH HARBR	0.988	447	447	175*	73553	DEVON#7	1.019	107	107	47*	73554	DEVON#8	1.016	107	107	47*			
73574	MILFD#1	0.000	305	0	0	73575	MILEPDE#2	0.000	305	0	0	73579	TOW ST1	0.000	188	0	0			
73580	TOW GT1	0.000	181	0	0	73581	TOW GT2	0.000	181	0	0	73588	MERIDEN1	1.064	305	305	165*			
73589	MERIDEN2	1.064	305	305	165*	73565	LAKERD#1	0.000	310	0	0	73566	LAKERD#2	0.000	310	0	0			
73567	LAKERD#3	0.000	310	0	0	72986	BERKPWR	0.000	305	0	0	73085	MT.TOM	0.000	146	0	0			
72372	BP #1 GN	0.000	241	0	0	73588	MERIDEN1	1.064	305	305	165*	73589	MERIDEN2	1.064	305	305	165*			
72375	BP #2 GN	0.000	241	0	0	72370	BP #3 GN	1.024	605	605	109	72371	BP #4 GN	1.030	425	425	81			
72661	MANCH09A	1.010	119	119	29	72662	MANCH10A	1.010	119	119	29	72663	MANCH11A	1.010	119	119	29			
72666	FRSQ SC1	0.000	46	0	0	72667	FRSQ SC2	0.000	46	0	0	72668	FRSQ SC3	0.994	46	46	-5			
71521	SOM G5	1 000	69	69	0	71522	SOM G6	0.945	105	105	0	71531	OSPI PF	1.015	77	77	10			
71532	OSP2 PF	1.015	77	77	10	71533	OSP3 PF	0.000	108	0	0	71534	OSP4 PF	1.015	77	77	10			
71535	OSP5 PF	1.015	77	77	10	71536	OSP6 PF	0.000	108	0	0	72671	HOPE G1	1.071	180	180	61			
72672	HOPE G2	1.067	180	180	61	72673	HOPE G3	1.071	185	185	61	73652	BE 11	0.000	170	0	0			
73653	BE 12	0.000	170	0	0	73654	BE 10 ST	0.000	180	0	0	71084	NEA GTPF	1.049	111	111	40*			
71085	NEA GTPF	1.049	110	110	40*	71086	NEA STPF	1.056	80	80	45	71095	ANPBLCK1	1.069	290	290	84			
71096	ANPBLCK2	1.069	290	290	84	72373	MPLP 1PF	1.029	109	109	53*	72374	MPLP 2PF	1.012	45	45	27*			
72377	BELL #1	1.097	290	290	150*	72378	BELL #2	1.097	290	290	150*	71394	DIGHTON	0.000	185	0	0			
71719	POTTER	1.032	89	89	-10	71743	TAU 9A,8	1.002	55	55	14	71744	TAUNT G9	1.049	85	85	52*			
70909	EDGR-GT1	1.035	215	215	11	70910	EDGR-GT2	1.035	215	215	11	70911	EDGR-ST1	1.035	276	276	17			
71369	MAPR1 PF	0.000	106	0	0	73070	MAPR2 PF	0.000	106	0	0	73071	MAPR3 PF	0.000	95	0	0			
72669	TIVER G1	0.118	189	189	9	72670	TIVER G2	0.102	92	92	5	71251	CANAL G1	1.038	566	567	236			
71252	CANAL G2	0.118	576	580	120*	71094	FLGRM G1	1.038	734	734	154	70825	MYS-GT1	0.000	215	0	0			
70826	MYS-GT12	0.000	215	0	0	70827	MYS-ST13	0.000	310	0	0	70822	MYS-ST10	1.035	276	276	-5			
70823	MYST-GT9	1.036	215	215	-5	70824	MYST-GT8	1.036	215	215	-5	71060	MYST G4	0.000	133	0	0			
71061	MYST G5	0.000	129	0	0	71062	MYST G6	0.000	136	0	0	71063	MYST G7	1.043	565	565	294			
71074	N.BOST 2	0.985	380	350	-46	71946	SALEM G1	1.024	81	81	32*	71947	SALEM G2	1.022	78	78	29*			
71948	SALEM G3	1.019	143	143	50*	71949	SALEM G4	0 000	400	0	0	71126	KEND CT	1.035	187	187	24			
71123	KENDALL	1.026	63	63	32*	71124	KND JETS	1.026	40	20	0	71175	TEWK-CT3	0.000	215	0	0			
91786	TEWK-CT2	0.000	215	0	0	91787	TEWK-CT1	0.000	215	0	0	91814	AES-CT1	1.042	280	279	45			
91815	AES-CT2	1 040	280	279	43	91816	AES-ST	1.035	280	280	31	91972	LOWELL	0.000	98	0	0			
73072	ALT1 PF	1.030	65	65	19	73073	ALT34 PF	1.029	81	81	19	71945	RESCO	1.042	33	33	20*			
70010	CONED-G1	1.009	169	169	56	70011	CONED-G2	1.009	169	169	56	70012	CONED-G3	1.005	195	195	56			
72869	SBRK G1	0.118	1150	399	72868	WWNGT G1	0.000	422	0	0	72870	SCHILLER	0.000	50	0	0				
72871	SCHILLER	0.988	50	50	25*	72872	SCHILLER	0.988	50	50	25*	72866	MERMK G1	1.042	113	113	35			
72867	MERMK G2	1.042	320	320	99	70365	WF WY #1	1.011	57	57	6	70366	WF WY #2	1.011	57	57	6			
70367	WF WY #3	1.011	125	125	12	70368	WF WY #4	1.059	636	636	242*	70377	AEC G1	1.040	58	58	7			
70378	AEC G2	1.040	58	58	7	70379	AEC G3	1.040	58	58	7	70381	RPA CG1	1.040	179	179	40			
70382	RPA SG2	1 040	94	94	15	70060	MIS GT1	0.000	179	0	0	70061	MIS GT2	0.000	179	0	0			
70062	MIS ST	0 000	191	0	0	70389	BUCKS G4	1.040	191	191	86	70705	VTYAK G	0 971	563	563	150*			
70386	WBK G1	1 040	185	185	31	70387	WBK G2	1.040	185	185	31	70388	WBK G3	1.040	196	196	34			
73083	NRTHED12	0 992	540	270	80	73084	NRTHED12	0.000	540	0	0	72512	BRSPW G1	0.994	294	294	71			
72513	BRSPW G2	0 000	294	0	0	72243	MILLENC1	1.016	273	273	64	72244	MILLENST	1.013	117	117	29			

	MW	MX		MW	MX		MW	MX
MILLSTONE	2008	341	MIDDLETOWN	633	287	MONTVILLE	483	207
NORWALK_HARBOR	330	11	NEW HAVEN HBR	447	175	BRIDGEPORT_HBR	545	237
S.MEADOW_CRR-A-C	77	0	WALLINGFORD	0	0	TOWANTIC	0	0
DEVON	214	94	BRAYTON POINT	1030	190	MANCHESTER_ST	403	82
SOMERSET	174	0	OCEAN STATE PWR	308	42	BE-CT	0	0
HOPE_ENERGY	545	183	NEA-BELLINGHAM	301	125	CANAL	1167	356
SITHE-MYSTIC345	706	-14	MYSTIC 44&6	0	0	SITHE-MYSTIC115	0	0
KENDALL_13.8	83	32	KENDALL REPOWER	187	24	GE-ALT1	146	38
SITHE-EDGAR	706	39	POTTER-MA	89	-10	TAUNTON-MA	140	66
SALEM_HARBOR	302	111	ANDROSCOGGIN_EC	173	21	RPA	273	55
WESTBROOK-ME	565	97	COMERFORD-NH	133	3	NU-NEWINGTON	0	0
CONED-NEWINGTON	533	168	M.I.S.-ME	0	0	MOORE-NH	139	26
SCHILLER-NH	100	50	MERRIMACK-NH	433	134	AES-LONDONDERRY	837	119
UAE-TEWSBURY	0	0	WYMAN	875	267	BEAR_SWAMP	294	71
NORTHFIELD	270	80	STONY_BROOK	412	108	MASS_POWER	0	0
ANP-BELLINGHAM	580	300	ANP-BLACKSTONE	580	168	EMI-TIVERTON	281	14
MILLENNIUM	390	93	IDC-BELLINGHAM	0	0	MILFORD_PWR-CT	153	80

INTERFACE FLOWS

NB-NE	700	700	-36	MEYANKEE-SOUTH	1350	321	-62	MAINE-NH	1400	1249	-41
NNE-SCOBIE+394	2550	2337	172	SEABROOK-SOUTH	1400	1363	206	NORTH-SOUTH	3000	2610	1
CMFD/MOORE-50	920	161	-5	SNDYPOND-SOUTH	4000	2275	112	CONN EXPORT	2100	-1762	121
CONN-MASS	***	-707	153	CONN-RI	****	-792	20	SW CONN IMPORT	1700	2161	-12
BOSTON_IMPORT	2600	3317	-20	NEMA/BOS IMPORT	3200	3848	23	SEMA/RI EXPORT	1900	2464	74
SEMA_EXPORT	1400	792	-189	GREATER RI EXP	****	1676	207	CONVEX-REMVEC	****	-2018	135
EAST-WEST	2000 (2200)	2417	129	NY-NE	2200 (1700)	9	-31	PV-20	****	84	-6

HVDC TRANSFERS FROM H-Q
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 CHAT-1 = 0  
 MADAWASK = 150  
 CHAT-2 = 0  
 PHII-P1 = 1000  
 HIGHGATE = 215  
 PHII-P2 = 1000

| BUS VOLTAGES     |       |             |                |                |        |                |                |      |      |
|------------------|-------|-------------|----------------|----------------|--------|----------------|----------------|------|------|
|                  | V     | LMT         | V              | LMT            | V      | LMT            |                |      |      |
| 70001 CHESTER    | 345   | 340.        | 70002 ORRINGTN | 345            | 344.   | 70027 ORRINGTN | 115            | 116. |      |
| 70003 MAXCYS     | 345   | 348.        | 70170 BOWMAN   | 115            | 121.   | 70003 MAXCYS   | 345            | 348. |      |
| 70120 MAXCYS     | 115   | 123. H      | 70512 ESX B-2  | 115            | 115. L | 70086 ME YANK  | 345            | 349. |      |
| 70087 SUROWIEC   | 345   | 350.        | 70090 BUXTON   | 345            | 352.   | 72692 NWGTN345 | 345            | 357. |      |
| 72694 SEBRK345   | 345   | 357.        | 70487 COOL     | 345            | 353.   | 71789 TEWKS    | 345            | 357. |      |
| 70759 MYSTIC     | 345   | 360.        | 71797 MILLBURY | 345            | 355.   | 72925 LUDLOW   | 345            | 346. |      |
| 72926 NRTHFLD    | 345   | 352.        | 73106 SOUTHGTN | 345            | 351.   | 73108 CARD     | 345            | 352. |      |
| 73109 MONTVILLE  | 345   | 357.        | 73110 MILLSTNE | 345            | 357.   | 73116 MIDDLTWN | 345            | 357. |      |
| 71801 BRAYTN P   | 345   | 358.        | 71811 KENT CO. | 345            | 353.   | 71336 SHERMAN  | 345            | 355. |      |
| 71338 OS POWER   | 345   | 355.        | 71337 WFARNUM  | 345            | 354    | 70772 W MEDWAY | 345            | 357. |      |
| 70780 WWALP345   | 345   | 356.        | 70783 PILGRIM  | 345            | 359.   | 70773 NEA 336  | 345            | 358. |      |
| 71193 CANAL      | 345   | 359.        | 71133 CARVER   | 345            | 357.   | 70795 FRMNGHAM | 230            | 236. |      |
| 70818 MYSTC MA   | 115   | 120.        | 70900 HOLBROOK | 115            | 118.   | 70901 EDGAR    | 115            | 119. |      |
| 71891 SALEM HR   | 115   | 117.        | 72096 MILLBURY | 115            | 112.   | 71377 SOMERSET | 115            | 117. |      |
| 72277 MIDWEYMT   | 115   | 118.        | 71403 WFARNUM  | 115            | 117.   | 72584 HARTAVE  | 115            | 119. |      |
| 72544 JOHNSTM1   | 115   | 119.        | 0.0            | 72545 JOHNSTM2 | 115    | 119.           | 72560 DRUMROCK | 115  | 117. |
| 72565 KENT CO    | 115   | 117.        | 0.0            | 72572 W.KNGST  | 115    | 113.           |                |      | 0.0  |
| AREA/ZONE TOTALS |       |             |                |                |        | 0.0            |                |      |      |
| NEPOOL_GEN       | 24/22 | NEPOOL_LOAD | 26961          | NEPOOL_LOSS    | 741    | NEPOOL_INT     | -2987          |      |      |

D2.2006. T&D CAPS, NO UPGRADES. MYS456,BLK9,SH4 OFF. NB0350MW  
 MYS7&8,KEND,SH1-3 ON. BI=3477.EW2420.NS2588.SRIEX2659.28.1GW

| GENERATION |          |          |      |      |      |       |           |          |      |      |      |       |          |          |     |     |      |
|------------|----------|----------|------|------|------|-------|-----------|----------|------|------|------|-------|----------|----------|-----|-----|------|
|            | V        | MAX      | MW   | MX   |      | V     | MAX       | MW       | MX   |      | V    | MAX   | MW       | MX       |     |     |      |
| 73562      | MILL#2   | 0.999    | 862  | 862  | 166  | 73563 | MILL#3    | 0.995    | 1146 | 1146 | 166  | 73555 | MIDDTN#2 | 1.027    | 117 | 117 | 54*  |
| 73556      | MIDDTN#3 | 1.004    | 233  | 233  | 81   | 73557 | MIDDTN#4  | 1.024    | 400  | 400  | 200* | 73558 | MONTV#5  | 1.005    | 81  | 81  | 27*  |
| 73559      | MONTV#6  | 1.014    | 402  | 402  | 180  | 73551 | NORHAR#1  | 0.986    | 162  | 162  | 9    | 73552 | NORHAR#2 | 0.987    | 168 | 168 | 9    |
| 73646      | BPTHBR#1 | 0.000    | 0    | 0    | 0    | 73647 | BPTHBR#2  | 1.009    | 170  | 170  | 115* | 73648 | BPTHBR#3 | 0.995    | 375 | 375 | 135  |
| 73549      | SMD1112J | 0.000    | 93   | 0    | 0    | 73550 | SMD1314J  | 0.000    | 93   | 0    | 0    | 72665 | COLFAX   | 1.010    | 75  | 75  | -8   |
| 73594      | WALL_LV1 | 0.000    | 102  | 0    | 0    | 73595 | WALL_LV2  | 0.000    | 102  | 0    | 0    | 73596 | WALL_LV3 | 0.000    | 51  | 0   | 0    |
| 73651      | NH HARBR | 0.987    | 447  | 447  | 175* | 73553 | DEVON#7   | 1.019    | 107  | 107  | 47*  | 73554 | DEVON#8  | 1.015    | 107 | 107 | 47*  |
| 73574      | MILFD#1  | 0.000    | 305  | 0    | 0    | 73575 | MILFD#2   | 0.000    | 305  | 0    | 0    | 73579 | TOW_ST1  | 0.000    | 188 | 0   | 0    |
| 73580      | TOW GT1  | 0.000    | 181  | 0    | 0    | 73581 | TOW GT2   | 0.000    | 181  | 0    | 0    | 73588 | MERIDEN1 | 1.064    | 305 | 305 | 165* |
| 73589      | MLRIDEN2 | 1.064    | 305  | 305  | 165* | 73565 | LAKERD#1  | 0.000    | 310  | 0    | 0    | 73566 | LAKERD#2 | 0.000    | 310 | 0   | 0    |
| 73567      | LAKERD#3 | 0.000    | 310  | 0    | 0    | 72986 | BERKPRW   | 0.000    | 305  | 0    | 0    | 73085 | M.T.TOM  | 0.000    | 146 | 0   | 0    |
| 72372      | BP #1 GN | 0.000    | 241  | 0    | 0    | 73588 | MERIDEN1  | 1.064    | 305  | 305  | 165* | 73589 | MERIDEN2 | 1.064    | 305 | 305 | 165* |
| 72375      | BP #2 GN | 0.000    | 241  | 0    | 0    | 72370 | BP #3 GN  | 1.025    | 605  | 605  | 115  | 72371 | BP #4 GN | 1.031    | 425 | 425 | 86   |
| 72661      | MANCH09A | 1.012    | 119  | 119  | 33   | 72662 | MANCH10A  | 1.012    | 119  | 119  | 33   | 72663 | MANCH11A | 1.012    | 119 | 119 | 33   |
| 72666      | FRSQ SC1 | 0.000    | 46   | 0    | 0    | 72667 | FRSQ SC2  | 0.992    | 46   | 46   | -5   | 72668 | FRSQ SC3 | 0.000    | 46  | 0   | 0    |
| 71521      | SOM G5   | 0.998    | 69   | 69   | 0    | 71522 | SOM G6    | 0.944    | 105  | 105  | 0    | 71531 | OSPI1    | PF 1.014 | 77  | 77  | 10   |
| 71532      | OSP2     | PF 1.014 | 77   | 77   | 10   | 71533 | OSP3      | PF 0.000 | 108  | 0    | 0    | 71534 | OSP4     | PF 1.014 | 77  | 77  | 10   |
| 71535      | OSP5     | PF 1.014 | 77   | 77   | 10   | 71536 | OSP6      | PF 1.014 | 108  | 108  | 14   | 72671 | HOPE_G1  | 1.073    | 180 | 180 | 64   |
| 72672      | HOPE_G2  | 1.069    | 180  | 180  | 64   | 72673 | HOPE_G3   | 1.073    | 185  | 185  | 64   | 73652 | BE_11    | 0.000    | 170 | 0   | 0    |
| 73653      | BE_12    | 0.000    | 170  | 0    | 0    | 73654 | BE_10_ST  | 0.000    | 180  | 0    | 0    | 71084 | NEA_GTPF | 1.049    | 111 | 111 | 40*  |
| 71085      | NIA_GTPF | 1.049    | 110  | 110  | 40*  | 71086 | NEA_STPF  | 1.066    | 80   | 80   | 55*  | 71095 | ANPBLCK1 | 1.070    | 290 | 290 | 86   |
| 71096      | ANPBLCK2 | 1.070    | 290  | 290  | 86   | 72373 | MPLP_1PF  | 1.026    | 109  | 109  | 53*  | 72374 | MPLP_2PF | 1.009    | 45  | 45  | 27*  |
| 72177      | BFLL #1  | 0.097    | 290  | 290  | 150* | 72378 | BELL #2   | 1.097    | 290  | 290  | 150* | 71394 | DIGHTON  | 0.971    | 185 | 185 | 2    |
| 71719      | POTTUR   | 1.031    | 89   | 89   | -10  | 71743 | TAU_9A,8  | 1.041    | 55   | 55   | 24   | 71744 | TAUNT_G9 | 1.049    | 85  | 85  | 52*  |
| 70909      | EDGR-GT1 | 1.035    | 215  | 215  | 13   | 70910 | EDGR-GT2  | 1.035    | 215  | 215  | 13   | 70911 | EDGR-ST1 | 1.035    | 276 | 276 | 19   |
| 73069      | MAPR1 PF | 0.000    | 106  | 0    | 0    | 73070 | MAPR2 PF  | 0.000    | 106  | 0    | 0    | 73071 | MAPR3 PF | 0.000    | 95  | 0   | 0    |
| 72669      | TIVER_G1 | 1.021    | 189  | 189  | 14   | 72670 | TIVER_G2  | 1.023    | 92   | 92   | 7    | 71251 | CANAL_G1 | 1.038    | 566 | 587 | 239* |
| 72672      | CANAL_G2 | 1.017    | 576  | 580  | 120* | 71094 | PLGRM_G1  | 1.038    | 734  | 734  | 160  | 70825 | MYS-GT11 | 0.000    | 215 | 0   | 0    |
| 70826      | MYS-GT12 | 0.000    | 215  | 0    | 0    | 70827 | MYS-ST13  | 0.000    | 310  | 0    | 0    | 70822 | MYS-ST10 | 1.025    | 276 | 276 | -28  |
| 70823      | MYST-GT9 | 1.026    | 215  | 215  | -28  | 70824 | MYST-GT8  | 1.026    | 215  | 215  | -28  | 71060 | MYST_G4  | 0.000    | 133 | 0   | 0    |
| 71061      | MYST_G5  | 0.000    | 129  | 0    | 0    | 71062 | MYST_G6   | 0.000    | 136  | 0    | 0    | 71063 | MYST_G7  | 1.043    | 565 | 565 | 295  |
| 71074      | N_ROST_2 | 1.035    | 380  | 350  | 173  | 71946 | SALEM_G1  | 1.023    | 81   | 81   | 32*  | 71947 | SALEM_G2 | 1.021    | 78  | 78  | 29*  |
| 71948      | SALEM_G3 | 1.018    | 143  | 143  | 50*  | 71949 | SALEM_G4  | 0.000    | 400  | 0    | 0    | 71126 | KEND_C1  | 1.035    | 187 | 187 | 17   |
| 71123      | KENDALL  | 1.023    | 63   | 63   | 32*  | 71124 | KND_JETS  | 1.025    | 40   | 20   | 2    | 91785 | TEWK-CT3 | 0.000    | 215 | 0   | 0    |
| 91786      | TFWK-CT2 | 0.000    | 215  | 0    | 0    | 91787 | TEWK-CT1  | 0.000    | 215  | 0    | 0    | 91814 | AES-CT1  | 1.043    | 280 | 279 | 46   |
| 91815      | AES-CT2  | 1.041    | 280  | 279  | 44   | 91816 | AES-ST    | 1.036    | 280  | 280  | 32   | 91972 | LOWELL   | 0.000    | 98  | 0   | 0    |
| 13072      | ALT12    | PF 1.031 | 65   | 65   | 19   | 73073 | ALT34     | PF 1.029 | 81   | 81   | 19   | 71945 | RESCO    | 1.041    | 33  | 33  | 20*  |
| 78610      | CONED-G1 | 1.009    | 169  | 169  | 57   | 70011 | CONED-G2  | 1.009    | 169  | 169  | 57   | 70012 | CONED-G3 | 1.006    | 195 | 195 | 57   |
| 72869      | SBRG_G1  | 1.018    | 1150 | 1150 | 408  | 72868 | NNWNGY_G1 | 0.000    | 422  | 0    | 0    | 72870 | SCHILLER | 0.000    | 50  | 0   | 0    |
| 72871      | SCHILLER | 0.986    | 50   | 50   | 25*  | 72872 | SCHILLER  | 0.986    | 50   | 50   | 25*  | 72866 | MERMK_G1 | 1.043    | 113 | 113 | 36   |
| 72867      | MFRMK_G2 | 1.043    | 320  | 320  | 103  | 70365 | WF_WY #1  | 1.011    | 57   | 57   | 6    | 70366 | WF_WY #2 | 1.011    | 57  | 57  | 6    |
| 70367      | WF_WY #3 | 1.011    | 125  | 125  | 12   | 70368 | WF_WY #4  | 1.059    | 636  | 636  | 242* | 70377 | AEC_G1   | 1.040    | 58  | 58  | 7    |
| 70378      | AFC_G2   | 1.040    | 58   | 58   | 7    | 70379 | AEC_G3    | 1.040    | 58   | 58   | 7    | 70381 | RPA_CG1  | 1.040    | 179 | 179 | 40   |
| 70382      | RPA SG2  | 1.040    | 94   | 94   | 15   | 70060 | MIS GT1   | 0.000    | 179  | 0    | 0    | 70061 | MIS GT2  | 0.000    | 179 | 0   | 0    |
| 70062      | MIS ST   | 0.000    | 191  | 0    | 0    | 70389 | BUCKS_G4  | 1.040    | 191  | 191  | 85   | 70705 | VYAK_G   | 0.971    | 563 | 563 | 150* |
| 70386      | WBK_G1   | 1.040    | 185  | 185  | 32   | 70387 | WBK_G2    | 1.040    | 185  | 185  | 32   | 70388 | WBK_G3   | 1.040    | 196 | 196 | 34   |
| 73083      | NRTNHD12 | 0.993    | 540  | 270  | 80   | 73084 | NRTNHD34  | 0.000    | 540  | 0    | 0    | 72512 | BRSPW_G1 | 0.995    | 294 | 294 | 74   |
| 72513      | BRSPW_G2 | 0.000    | 294  | 0    | 0    | 72243 | MILLENC1  | 1.017    | 273  | 273  | 67   | 72244 | MILLENC1 | 1.014    | 117 | 117 | 30   |

|                 | MW   | MX  |                 | MW   | MX  |                 | MW   | MX  |
|-----------------|------|-----|-----------------|------|-----|-----------------|------|-----|
| MILLSTONE       | 2008 | 333 | MIDDLETOWN      | 750  | 335 | MONTVILLE       | 483  | 207 |
| NORWALK_HARBOR  | 330  | 17  | NEW_HAVEN_HBR   | 447  | 175 | BRIDGEPORT_HBR  | 545  | 250 |
| S_MEADOW_CRRA-C | 77   | 0   | WALLINGFORD     | 0    | 0   | TOWANTIC        | 0    | 0   |
| DEVON           | 214  | 94  | BRAYTON_POINT   | 1030 | 202 | MANCHESTER_ST   | 403  | 93  |
| SOMERSET        | 174  | 0   | OCEAN_STATE_PWR | 416  | 54  | BE-CT           | 0    | 0   |
| HOPE_ENERGY     | 545  | 193 | NEA-BELLINGHAM  | 301  | 135 | CANAL           | 1167 | 359 |
| SITHE-MYSTIC145 | 706  | -84 | MYSTIC_4856     | 0    | 0   | SITHE-MYSTIC115 | 0    | 0   |
| KENDALL_13_8    | 83   | 34  | KENDALL_REPOWER | 187  | 17  | GE-ALT1         | 146  | 39  |
| SITHE-EDGAR     | 706  | 45  | POTTER_MA       | 89   | -10 | TAUNTON-MA      | 140  | 76  |
| SALEM_HARBOR    | 302  | 111 | ANDROSCOGGIN_EC | 173  | 21  | RPA             | 273  | 55  |
| WESTBROOK-ME    | 565  | 97  | M.I.S.-ME       | 0    | 0   | NU-NEWINGTON    | 0    | 0   |
| CONED-NEWINGTON | 533  | 171 | COMERFORD-NH    | 133  | 4   | MOORE-NH        | 139  | 28  |
| SCHILLER-NH     | 100  | 50  | MERRIMACK-NH    | 433  | 140 | AES-LONDONDERRY | 837  | 122 |
| UAE-TWKSGBURY   | 0    | 0   | WYMAN           | 875  | 267 | BEAR_SWAMP      | 294  | 74  |
| NORTHFIELD      | 270  | 80  | STONY_BROOK     | 412  | 107 | MASS_POWER      | 0    | 0   |
| ANP-BELLINGHAM  | 580  | 300 | ANP-BLACKSTONE  | 580  | 171 | EMI-TIVERTON    | 281  | 21  |
| MILLENNIUM      | 390  | 97  | IDC-BELLINGHAM  | 0    | 0   | MILFORD_PWR-CT  | 153  | 80  |

|                | INTERFACE FLOWS |      |      |                 |             |      |     |                |      |       |     |
|----------------|-----------------|------|------|-----------------|-------------|------|-----|----------------|------|-------|-----|
|                |                 |      |      |                 |             |      |     |                |      |       |     |
| NB-NE          | 700             | 700  | -36  | MEYANKE-SOUTH   | 1350        | 322  | -62 | MAINE-NH       | 1400 | 1250  | -40 |
| NNE-SCOBIE+394 | 2550            | 2331 | 179  | SEABROOK-SOUTH  | 1400        | 1366 | 213 | NORTH-SOUTH    | 3000 | 2588  | 9   |
| CMFD/MOORE-50  | 920             | 160  | -3   | SNDYPOND-SOUTH  | 4000        | 2260 | 117 | CONN EXPORT    | 2100 | -1712 | 116 |
| CONN-MASS      | ***             | -671 | 152  | CONN-RI         | ****        | -806 | 23  | SW CONN IMPORT | 1700 | 2172  | -6  |
| BOSTON_IMPORT  | 2600            | 3477 | -38  | NEMA/BOS IMPORT | 3200        | 4013 | 9   | SEMA/RI EXPORT | 1900 | 2659  | 47  |
| SIEMA_EXPORT   | 1400            | 938  | -209 | GREATER RI EXP  | ****        | 1728 | 208 | CONVEX-REMVEC  | **** | -2005 | 146 |
| EAST-WLST      | 2000 (2200)     | 2420 | 121  | NY-NE           | 2200 (1700) | -22  | -24 | PV-20          | **** | 83    | -6  |

HVDC TRANSFERS FROM H-Q

|                |                |                |
|----------------|----------------|----------------|
| CHAT-1 = 0     | CHAT-2 = 0     | HIGHGATE = 215 |
| MADAWASK = 150 | PHII-P1 = 1000 | PHII-P2 = 1000 |

BUS VOLTAGES

| V LMT                     | V LMT                       | V LMT                       |
|---------------------------|-----------------------------|-----------------------------|
| 70001 CHESTER 345 340.    | 70002 ORRINGTON 345 344.    | 70027 ORRINGTON 115 116.    |
| 70003 MAXCYS 345 348      | 70170 BOWMAN 115 121.       | 70003 MAXCYS 345 348.       |
| 70120 MAXCYS 115 123 H    | 70512 ESX B-2 115 115 L     | 70086 ME YANK 345 349.      |
| 70087 SUROWIEC 345 350    | 70090 BUXTON 345 352.       | 72692 NWGTN345 345 357.     |
| 72694 SEBRK345 345 357.   | 70487 COOL 345 345 352.     | 71789 TEWKS 345 357.        |
| 70759 MYSTIC 345 360      | 71797 MILLBURY 345 355.     | 72925 LUDLOW 345 346        |
| 72926 NRTHFLD 345 352.    | 73106 SOUTHGTN 345 351.     | 73108 CARD 345 352.         |
| 73109 MONTVILLE 345 357.  | 73110 MILLSTNE 345 357.     | 73116 MIDDLETWN 345 357.    |
| 71801 BRAYTN P 345 358.   | 71811 KENT CO. 345 353.     | 71336 SHERMAN 345 355.      |
| 71338 OS POWER 345 355.   | 71337 WFARNUM 345 354.      | 70772 W MEDWAY 345 357.     |
| 70780 WWALP345 345 356.   | 70783 PILGRIM 345 359.      | 70773 NEA 336 345 358.      |
| 71193 CANAL 345 358.      | 71133 CARVER 345 356.       | 70795 FRMNGHAM 230 236.     |
| 70818 MYSTC MA 115 121. H | 70900 HOLBROOK 115 118.     | 70901 EDGAR 115 119.        |
| 71891 SALEM HR 115 117.   | 72096 MILLBURY 115 111.     | 0.0 71377 SOMERSET 115 117. |
| 72277 MIDWEYMT 115 118.   | 71403 WFARNUM 115 116.      | 72584 HARTAVE 115 119.      |
| 72544 JOHNSTNI 115 119.   | 0.0 72545 JOHNSTN2 115 119  | 0.0 72560 DRUMROCK 115 117. |
| 72565 KENT CO 115 117.    | 0.0 72572 W.KINGST 115 113. | 0.0 0.0                     |

AREA/ZONE TOTALS

|                  |                   |                 |                  |
|------------------|-------------------|-----------------|------------------|
| NEPOOL_GEN 25131 | NEPOOL_LOAD 27320 | NEPOOL_LOSS 760 | NEPOOL_INT -2957 |
|------------------|-------------------|-----------------|------------------|

D2.2007. T&D CAPS.NO UPGRDS. MYS456,BLK9,SH4 OFF. NB @ 350MW  
MYS768,KEND,SH1-3 ON.BI=3582.EW2416.NS2889.SRIEX2446. 28.6GW

| GENERATION |           |          |      |      |       |          |          |          |      |      |       |          |           |          |     |     |      |    |    |  |
|------------|-----------|----------|------|------|-------|----------|----------|----------|------|------|-------|----------|-----------|----------|-----|-----|------|----|----|--|
|            | V         | MAX      | MW   | MX   |       | V        | MAX      | MW       | MX   |      | V     | MAX      | MW        | MX       |     | V   | MAX  | MW | MX |  |
| 73562      | MILL#2    | 1.003    | 862  | 205  | 73563 | MILL#3   | 0.998    | 1146     | 1146 | 205  | 73555 | MIDDTN#2 | 0.987     | 117      | 117 | 54* |      |    |    |  |
| 73556      | MIDDTN#3  | 0.000    | 233  | 0    | 73557 | MIDDTN#4 | 1.019    | 400      | 400  | 200* | 73558 | MONTV#5  | 1.006     | 81       | 81  | 27* |      |    |    |  |
| 73559      | MONTV#6   | 1.018    | 402  | 200* | 73551 | NORHAR#1 | 0.987    | 162      | 162  | 10   | 73552 | NORHAR#2 | 0.987     | 168      | 168 | 10  |      |    |    |  |
| 73646      | BPTHBR#1  | 0.000    | 0    | 0    | 73647 | BPTHBR#2 | 1.009    | 170      | 170  | 115* | 73648 | BPTHBR#3 | 1.006     | 375      | 375 | 178 |      |    |    |  |
| 73549      | SMD112J   | 0.000    | 93   | 0    | 0     | 73550    | SMD1314J | 0.000    | 93   | 0    | 0     | 72665    | COLFAX    | 1.010    | 75  | 75  | -7   |    |    |  |
| 73594      | WALL_LV1  | 0.000    | 102  | 0    | 0     | 73595    | WALL_LV2 | 0.000    | 102  | 0    | 0     | 73596    | WALL_LV3  | 0.000    | 51  | 0   | 0    |    |    |  |
| 73651      | NH HARBR  | 0.979    | 447  | 447  | 175*  | 73553    | DEVON#7  | 1.016    | 107  | 107  | 47*   | 73554    | DEVON#8   | 1.012    | 107 | 107 | 47*  |    |    |  |
| 73574      | MILFD#1   | 0.000    | 305  | 0    | 0     | 73575    | MILFD#2  | 0.000    | 305  | 0    | 0     | 73579    | TOW_ST1   | 0.000    | 188 | 0   | 0    |    |    |  |
| 73580      | TOW_GT1   | 0.000    | 181  | 0    | 0     | 73581    | TOW_GT2  | 0.000    | 181  | 0    | 0     | 73588    | MERIDEN1  | 1.058    | 305 | 305 | 165* |    |    |  |
| 73589      | MERIDEN2  | 1.058    | 305  | 305  | 165*  | 73565    | LAKERD#1 | 0.000    | 310  | 0    | 0     | 73566    | LAKERD#2  | 0.000    | 310 | 0   | 0    |    |    |  |
| 73567      | LAKERD#3  | 0.000    | 310  | 0    | 0     | 72986    | BERKPWR  | 1.060    | 305  | 305  | 94    | 73085    | MT.TOM    | 0.000    | 146 | 0   | 0    |    |    |  |
| 72372      | BP #1 GN  | 0.000    | 241  | 0    | 0     | 73588    | MERIDEN1 | 1.058    | 305  | 305  | 165*  | 73589    | MERIDEN2  | 1.058    | 305 | 305 | 165* |    |    |  |
| 72375      | BP #2 GN  | 0.000    | 241  | 0    | 0     | 72370    | BP #3 GN | 1.027    | 605  | 605  | 135   | 72371    | BP #4 GN  | 1.035    | 425 | 425 | 101  |    |    |  |
| 72661      | MANCH09A  | 1.008    | 119  | 119  | 35*   | 72662    | MANCH10A | 0.000    | 119  | 0    | 0     | 72663    | MANCH11A  | 0.000    | 119 | 0   | 0    |    |    |  |
| 72666      | FRSQ SC1  | 0.000    | 46   | 0    | 0     | 72667    | FRSQ SC2 | 0.991    | 46   | 46   | -1    | 72668    | FRSQ SC3  | 0.991    | 46  | 46  | -2   |    |    |  |
| 71521      | SOM_G5    | 0.998    | 69   | 69   | 0     | 71522    | SOM_G6   | 0.943    | 105  | 105  | 0     | 71531    | OSPI      | PF 1.022 | 77  | 77  | 16   |    |    |  |
| 71532      | OSP2      | PF 1.022 | 77   | 77   | 16    | 71533    | OSP3     | PF 0.000 | 108  | 0    | 0     | 71534    | OSP4      | PF 1.022 | 77  | 77  | 16   |    |    |  |
| 71535      | OSP5      | PF 1.022 | 77   | 77   | 16    | 71536    | OSP6     | PF 1.022 | 108  | 108  | 21    | 72671    | HOPE_G1   | 1.081    | 180 | 180 | 77   |    |    |  |
| 72672      | HOPE_G2   | 1.076    | 180  | 180  | 77    | 72673    | HOPE_G3  | 1.082    | 185  | 185  | 77    | 73652    | BE_11     | 0.000    | 170 | 0   | 0    |    |    |  |
| 73653      | BE_12     | 0.000    | 170  | 0    | 0     | 73654    | BE_10_ST | 0.000    | 180  | 0    | 0     | 71084    | NEA_GTPF  | 1.048    | 111 | 111 | 40*  |    |    |  |
| 71085      | NEA_GTPF  | 1.048    | 110  | 110  | 40*   | 71086    | NEA_STPF | 1.065    | 80   | 80   | 55*   | 71095    | ANPBLCK1  | 1.083    | 290 | 290 | 114  |    |    |  |
| 71096      | ANPBLCK2  | 1.083    | 290  | 290  | 114   | 72373    | MPLP     | 1.019    | 109  | 109  | 53*   | 72374    | MPLP_2PF  | 1.002    | 45  | 45  | 27*  |    |    |  |
| 72377      | BELL #1   | 1.095    | 290  | 290  | 150*  | 72378    | BELL #2  | 1.095    | 290  | 290  | 150*  | 71394    | DIGHTON   | 0.974    | 185 | 185 | 6    |    |    |  |
| 71719      | POTTER    | 1.030    | 89   | 89   | -10   | 71743    | TAU_9A   | 1.068    | 55   | 55   | 32    | 71744    | TAUNT_G9  | 1.049    | 85  | 85  | 52*  |    |    |  |
| 70909      | EDGR-GT1  | 1.035    | 215  | 215  | 17    | 70910    | EDGR-GT2 | 1.035    | 215  | 215  | 17    | 70911    | EDGR-ST1  | 1.035    | 276 | 276 | 23   |    |    |  |
| 71069      | MAPR1     | PF 0.000 | 106  | 0    | 0     | 73070    | MAPR2    | PF 0.000 | 106  | 0    | 0     | 73071    | MAPR3     | PF 0.000 | 95  | 0   | 0    |    |    |  |
| 72669      | TIVER_G1  | 1.022    | 189  | 189  | 15    | 72670    | TIVER_G2 | 1.023    | 92   | 92   | 8     | 71251    | CANAL_G1  | 1.036    | 566 | 587 | 239* |    |    |  |
| 71257      | CANAL_G2  | 1.015    | 576  | 580  | 120*  | 71094    | PLGRM_G1 | 1.038    | 734  | 734  | 170   | 70825    | MYS-GT11  | 0.000    | 215 | 0   | 0    |    |    |  |
| 70826      | MYS-GT12  | 0.000    | 215  | 0    | 0     | 70827    | MYS-ST13 | 0.000    | 310  | 0    | 0     | 70822    | MYS-ST10  | 1.074    | 276 | 276 | 93   |    |    |  |
| 70823      | MYST-GT9  | 1.075    | 215  | 215  | 93    | 70824    | MYST-GT8 | 1.075    | 215  | 215  | 93    | 71060    | MYST_G4   | 0.000    | 133 | 0   | 0    |    |    |  |
| 71061      | MYST_G5   | 0.000    | 129  | 0    | 0     | 71062    | MYST_G6  | 0.000    | 136  | 0    | 0     | 71063    | MYST_G7   | 1.043    | 565 | 565 | 295  |    |    |  |
| 71074      | N.BOST_2  | 0.978    | 380  | 350  | -30   | 71946    | SALEM_G1 | 1.019    | 81   | 81   | 32*   | 71947    | SALEM_G2  | 1.017    | 78  | 78  | 29*  |    |    |  |
| 71948      | SALEM_G3  | 1.014    | 143  | 143  | 50*   | 71949    | SALEM_G4 | 0.000    | 400  | 0    | 0     | 71126    | KEND_CT   | 1.035    | 187 | 187 | 35   |    |    |  |
| 71123      | KENDALL_1 | 0.011    | 63   | 63   | 32*   | 71124    | KND_JETS | 1.014    | 40   | 20   | 3     | 91785    | TEWK-CT3  | 0.000    | 215 | 0   | 0    |    |    |  |
| 91786      | TEWK-CT2  | 0.000    | 210  | 0    | 0     | 91787    | TEWK-CT1 | 0.000    | 215  | 0    | 0     | 91814    | AES-CT1   | 1.047    | 280 | 279 | 55   |    |    |  |
| 91815      | AES-CT2   | 1.045    | 280  | 279  | 52    | 91816    | AES-ST   | 1.043    | 280  | 280  | 45    | 91972    | LOWELL    | 0.000    | 98  | 0   | 0    |    |    |  |
| 73072      | ALT12     | PF 1.034 | 65   | 65   | 23    | 73073    | ALT34    | PF 1.033 | 81   | 81   | 23    | 71945    | RESCO     | 1.037    | 33  | 33  | 20*  |    |    |  |
| 70010      | CONED-G1  | 1.016    | 169  | 169  | 72    | 70011    | CONED-G2 | 1.016    | 169  | 169  | 72    | 70012    | CONED-G3  | 1.012    | 195 | 195 | 72   |    |    |  |
| 72869      | SBRK_G1   | 1.028    | 1150 | 1150 | 550*  | 72868    | WNNGT_G1 | 0.999    | 422  | 422  | 72    | 72870    | SCHILLER  | 0.000    | 50  | 0   | 0    |    |    |  |
| 72871      | SCHILLER  | 0.000    | 50   | 0    | 0     | 72872    | SCHILLER | 0.955    | 50   | 50   | 25*   | 72866    | MERMIC_G1 | 1.052    | 113 | 113 | 49   |    |    |  |
| 72867      | MDRMK_G7  | 1.052    | 320  | 320  | 139   | 70365    | WF_WY #1 | 1.021    | 57   | 57   | 12    | 70366    | WF_WY #2  | 0.000    | 57  | 0   | 0    |    |    |  |
| 70367      | WF_WY #3  | 1.019    | 125  | 125  | 24    | 70368    | WF_WY #4 | 1.045    | 636  | 636  | 242*  | 70377    | AEC_G1    | 1.040    | 58  | 58  | 10   |    |    |  |
| 70378      | AEC_G2    | 1.040    | 58   | 58   | 10    | 70379    | AEC_G3   | 1.040    | 58   | 58   | 10    | 70381    | RPA_CG1   | 0.000    | 179 | 0   | 0    |    |    |  |
| 70382      | RPA SG2   | 0.000    | 94   | 0    | 0     | 70060    | MIS GT1  | 1.078    | 179  | 179  | 81    | 70061    | MIS GT2   | 1.078    | 179 | 179 | 81   |    |    |  |
| 70062      | MIS_ST    | 1.077    | 191  | 191  | 81    | 70389    | BUCKS_G4 | 1.040    | 191  | 191  | 58    | 70705    | VITYAK_G  | 0.963    | 563 | 563 | 150* |    |    |  |
| 70386      | WBK_G1    | 1.040    | 185  | 185  | 40    | 70387    | WBK_G2   | 1.040    | 185  | 185  | 40    | 70388    | WBK_G3    | 1.040    | 196 | 196 | 43   |    |    |  |
| 73083      | NRTHFD12  | 0.988    | 540  | 270  | 80    | 73084    | NRTHFD34 | 0.000    | 540  | 0    | 0     | 72512    | BRSWP_G1  | 1.001    | 294 | 294 | 88   |    |    |  |
| 72513      | BRSWP_G2  | 0.000    | 294  | 0    | 0     | 72243    | MILLENST | 1.022    | 273  | 273  | 77    | 72244    | MILLENST  | 1.018    | 117 | 117 | 35   |    |    |  |

|                 | MW   | MX  |                 | MW   | MX  |                 | MW   | MX  |  | MW | MX |
|-----------------|------|-----|-----------------|------|-----|-----------------|------|-----|--|----|----|
| MILLSTONE       | 2008 | 410 | MIDDLETOWN      | 517  | 254 | MONTVILLE       | 483  | 227 |  |    |    |
| NORWALK_HARBOR  | 330  | 19  | NEW_HAVEN_HBR   | 447  | 175 | BRIDGEPORT_HBR  | 545  | 293 |  |    |    |
| S_MEADOW_CRRA-C | 77   | 4   | WALLINGFORD     | 0    | 0   | TOWANTIC        | 0    | 0   |  |    |    |
| DEVON           | 214  | 94  | BRAYTON_POINT   | 1030 | 236 | MANCHESTER_ST   | 211  | 32  |  |    |    |
| SOMERSET        | 174  | 0   | OCEAN_STATE_PWR | 416  | 83  | BE-CT           | 0    | 0   |  |    |    |
| HOPC_ENERGY     | 545  | 231 | NEA-BELLINGHAM  | 301  | 135 | CANAL           | 1167 | 359 |  |    |    |
| SITHE-MYSTIC345 | 706  | 278 | MYSTIC_45&6     | 0    | 0   | SITHE-MYSTIC115 | 0    | 0   |  |    |    |
| KENDALL_13_8    | 83   | 35  | KENDALL_REPOWER | 187  | 35  | GE-ALT1         | 146  | 45  |  |    |    |
| SITHE-EDGAR     | 706  | 57  | POTTER-MA       | 89   | -10 | TAUNTON-MA      | 140  | 84  |  |    |    |
| SALEM_HARBOR    | 302  | 111 | ANDROSCOGGIN_EC | 173  | 30  | RPA             | 0    | 0   |  |    |    |
| WESTBROOK-ME    | 565  | 122 | M.I.S.-ME       | 549  | 242 | NU-NEWINGTON    | 422  | 72  |  |    |    |
| CONED-NEWINGTON | 533  | 217 | COMPERFORD-NH   | 133  | 19  | MOORE-NH        | 139  | 31  |  |    |    |
| SCHILLER-NH     | 50   | 25  | MERRIMACK-NH    | 433  | 188 | AES-LONDONDERRY | 837  | 152 |  |    |    |
| UAE-TEWKSBURY   | 0    | 0   | WYMAN           | 818  | 278 | BEAR_SWAMP      | 294  | 88  |  |    |    |
| NORTHFIELD      | 270  | 80  | STONY_BROOK     | 412  | 111 | MASS_POWER      | 0    | 0   |  |    |    |
| ANP-BELLINGHAM  | 580  | 300 | ANP-BLACKSTONE  | 580  | 228 | EMI-TIVERTON    | 281  | 23  |  |    |    |
| MILLENNIUM      | 390  | 111 | IDC-BELLINGHAM  | 0    | 0   | MILFORD_PWR-CT  | 153  | 80  |  |    |    |

#### INTERFACE FLOWS

| NB-NE          | 700  | 700  | -43 | MEYANKEE-SOUTH | 1350 | 617  | -108 | MAINE-NH       | 1400 | 1326  | -59 |
|----------------|------|------|-----|----------------|------|------|------|----------------|------|-------|-----|
| NNE-SCOBIE+394 | 2550 | 2743 | 280 | SEABROOK-SOUTH | 1400 | 1619 | 324  | NORTH-SOUTH    | 3000 | 2889  | 20  |
| CMFD/MOORE-50  | 920  | 153  | 11  | SNDYPOND-SOUTH | 4000 | 2371 | 33   | CONN_EXPORT    | 2100 | -1944 | 101 |
| CONN-MASS      | ***  | -862 | 156 | CONN-RI        | ***  | -790 | 14   | SW_CONN_IMPORT | 1700 | 2231  | 17  |
| BOSTON_IMPORT  | 2600 | 3582 | 2   |                |      |      |      |                |      |       |     |

## HVDC TRANSFERS FROM H-Q

CHAT-1 = 0  
MADAWASK = 150

CHAT-2 = 0  
PHII-P1 = 1000

HIGHGATE = 215  
PHII-P2 = 1000

## BUS VOLTAGES

|                  | V     | LMT         |                 | V              | LMT    |                 | V              | LMT            |      |      |
|------------------|-------|-------------|-----------------|----------------|--------|-----------------|----------------|----------------|------|------|
| 70001 CHESTER    | 345   | 342.        | 70002 ORRINGTON | 345            | 347.   | 70027 ORRINGTON | 115            | 120.           |      |      |
| 70003 MAXCYS     | 345   | 341.        | 70170 BOWMAN    | 115            | 120.   | 70003 MAXCYS    | 345            | 341.           |      |      |
| 70120 MAXCYS     | 115   | 122. H      | 70512 ESX B-2   | 115            | 114. L | 70086 ME YANK   | 345            | 343.           |      |      |
| 70087 SUROWIEC   | 345   | 345.        | 70090 BUXTON    | 345            | 347.   | 72692 NWGTN345  | 345            | 357.           |      |      |
| 72694 SEBRK345   | 345   | 357.        | 70487 COOL      | 345            | 349.   | 71789 TEWKS     | 345            | 356.           |      |      |
| 70759 MYSTIC     | 345   | 360.        | 71797 MILLBURY  | 345            | 354.   | 72925 LUDLOW    | 345            | 346.           |      |      |
| 72926 NRTHFLD    | 345   | 350.        | 73106 SOUTHGTN  | 345            | 349.   | 73108 CARD      | 345            | 352.           |      |      |
| 73109 MONTVILLE  | 345   | 357.        | 73110 MILLSTNE  | 345            | 357.   | 73116 MIDDLTWN  | 345            | 355.           |      |      |
| 71801 BRAYTN P   | 345   | 358.        | 71811 KENT CO.  | 345            | 353.   | 71336 SHERMAN   | 345            | 355.           |      |      |
| 71338 OS POWER   | 345   | 355.        | 71337 WFARNUM   | 345            | 354.   | 70772 W MEDWAY  | 345            | 356.           |      |      |
| 70780 WWALP345   | 345   | 355.        | 70783 PILGRIM   | 345            | 358.   | 70773 NEA 336   | 345            | 358.           |      |      |
| 71193 CANAL      | 345   | 358.        | 71133 CARVER    | 345            | 356.   | 70795 FRMNGHAM  | 230            | 234.           |      |      |
| 70818 MYSTC MA   | 115   | 119.        | 70900 HOLBROOK  | 115            | 118.   | 70901 EDGAR     | 115            | 119.           |      |      |
| 71891 SALEM HR   | 115   | 117.        | 72096 MILLBURY  | 115            | 111.   | 0.0             | 71377 SOMERSET | 115            | 116. |      |
| 72277 MIDWEYMT   | 115   | 118         | 71403 WFARNUM   | 115            | 116.   | 72584 HARTAVE   | 115            | 118.           |      |      |
| 72544 JOHNSTN1   | 115   | 119         | 0.0             | 72545 JOHNSTN2 | 115    | 118.            | 0.0            | 72560 DRUMROCK | 115  | 117. |
| 72565 KENT CO    | 115   | 117.        | 0.0             | 72572 W.KINGST | 115    | 113.            | 0.0            |                |      | 0.0  |
| AREA/ZONE TOTALS |       |             |                 |                |        |                 |                |                |      |      |
| NEPOOL_GEN       | 25603 | NEPOOL_LOAD | 27788           | NEPOOL_LOSS    | 809    | NEPOOL_INT      | -3001          |                |      |      |

D2.2008. T&D CAPS.NO UPGRADS. MYS456,BK9,SH4 OFF. NB @ 350MW  
MYS7&8,KEND,SH1-3 ON BI=3602.EW2416.NS2857.SRIEX2592. 29.0GW

| GENERATION       |            |       |                 |                 |            |                 |           |                |       |       |      |       |          |        |       |       |      |    |   |
|------------------|------------|-------|-----------------|-----------------|------------|-----------------|-----------|----------------|-------|-------|------|-------|----------|--------|-------|-------|------|----|---|
|                  | V          | MAX   | MW              | MX              |            | V               | MAX       | MW             | MX    |       | V    | MAX   | MW       | MX     |       |       |      |    |   |
| 73562            | MILL#2     | 1.002 | 862             | 862             | 192        | 73563           | MILL#3    | 0.997          | 1146  | 1146  | 192  | 73555 | MIDDTN#2 | 1.027  | 117   | 117   | 54*  |    |   |
| 73556            | MIDDTN#3   | 1.005 | 233             | 233             | 83         | 73557           | MIDDTN#4  | 1.021          | 400   | 400   | 200* | 73558 | MONTV#5  | 1.006  | 81    | 81    | 27*  |    |   |
| 73559            | MONTV#6    | 1.018 | 402             | 402             | 200*       | 73551           | NORHAR#1  | 0.990          | 162   | 162   | 15   | 73552 | NORHAR#2 | 0.990  | 168   | 168   | 15   |    |   |
| 73646            | BPTHBR#1   | 0 000 | 0               | 0               | 0          | 73647           | BPTHBR#2  | 1.009          | 170   | 170   | 115* | 73648 | BPTHBR#3 | 1.009  | 375   | 375   | 192  |    |   |
| 73549            | SMD1112J   | 0.000 | 93              | 0               | 0          | 73550           | SMD1314J  | 0.000          | 93    | 0     | 0    | 72665 | COLFAX   | 1.010  | 75    | 75    | -8   |    |   |
| 73594            | WALL_LV1   | 0.000 | 102             | 0               | 0          | 73595           | WALL_LV2  | 0.000          | 102   | 0     | 0    | 73566 | WALL_LV3 | 0.000  | 51    | 0     | 0    |    |   |
| 73651            | NH HARBR   | 0.981 | 447             | 447             | 175*       | 73553           | DEVON#7   | 1 016          | 107   | 107   | 47*  | 73554 | DEVON#8  | 1.012  | 107   | 107   | 47*  |    |   |
| 73574            | MILPFD#1   | 0.000 | 305             | 0               | 0          | 73575           | MILPFD#2  | 0.000          | 305   | 0     | 0    | 73579 | TOW_ST1  | 0 000  | 188   | 0     | 0    |    |   |
| 73580            | TOW_GT1    | 0.000 | 181             | 0               | 0          | 73581           | TOW_GT2   | 0.000          | 181   | 0     | 0    | 73588 | MERIDEN1 | 1.059  | 305   | 305   | 165* |    |   |
| 73589            | MERIDEN2   | 1 059 | 305             | 305             | 165*       | 73565           | LAKERD#1  | 0.000          | 310   | 0     | 0    | 73566 | LAKERD#2 | 0.000  | 310   | 0     | 0    |    |   |
| 73567            | LAKERD#3   | 0 000 | 310             | 0               | 0          | 72986           | BERKPWR   | 1.053          | 305   | 305   | 82   | 73085 | MT_TOM   | 0.000  | 146   | 0     | 0    |    |   |
| 72372            | BP #1 GN   | 0.000 | 241             | 0               | 0          | 73588           | MERIDEN1  | 1.059          | 305   | 305   | 165* | 73589 | MERIDEN2 | 1.059  | 305   | 305   | 165* |    |   |
| 72375            | BP #2 GN   | 0.000 | 241             | 0               | 0          | 72370           | BP #3 GN  | 1 026          | 605   | 605   | 130  | 72371 | BP #4 GN | 1.034  | 425   | 425   | 97   |    |   |
| 72661            | MANCH09A   | 1.013 | 119             | 119             | 34         | 72662           | MANCH10A  | 1.013          | 119   | 119   | 34   | 72663 | MANCH11A | 1.013  | 119   | 119   | 34   |    |   |
| 72666            | FRSQ SC1   | 0.000 | 46              | 0               | 0          | 72667           | FRSQ SC2  | 0.992          | 46    | 46    | -5   | 72668 | FRSQ SC3 | 0.994  | 46    | 46    | -5   |    |   |
| 71521            | SOM_G5     | 0.997 | 69              | 69              | 0          | 71522           | SOM_G6    | 0.943          | 105   | 105   | 0    | 71531 | OSPI_PP  | 1.017  | 77    | 77    | 12   |    |   |
| 71532            | OSPF_PP    | 1.017 | 77              | 77              | 12         | 71533           | OSPF3_PP  | 0.000          | 108   | 0     | 0    | 71534 | OSPF4_PP | 1.017  | 77    | 77    | 12   |    |   |
| 71535            | OSPF_PP    | 1.017 | 77              | 77              | 12         | 71536           | OSPF_PP   | 1.017          | 108   | 108   | 16   | 72671 | HOPF_G1  | 1.075  | 180   | 180   | 68   |    |   |
| 72672            | HOPE_G2    | 1.071 | 180             | 180             | 68         | 72673           | HOPE_G3   | 1.075          | 185   | 185   | 68   | 73652 | BE_11    | 0.000  | 170   | 0     | 0    |    |   |
| 73653            | BE_12      | 0.000 | 170             | 0               | 0          | 73654           | BE_10_ST  | 0.000          | 180   | 0     | 0    | 71084 | NEA_GTPF | 1.048  | 111   | 111   | 40*  |    |   |
| 71085            | NEA_GTPF   | 1.048 | 110             | 110             | 40*        | 71086           | NEA_STPF  | 1.065          | 80    | 80    | 55*  | 71095 | ANPBLCK1 | 1.083  | 290   | 290   | 114  |    |   |
| 71096            | ANPBLCK2   | 1.083 | 290             | 290             | 114        | 72373           | MPLP_1FF  | 1.018          | 109   | 109   | 53*  | 72374 | MPLP_2PF | 1.000  | 45    | 45    | 27*  |    |   |
| 72377            | BELL #1    | 1.095 | 290             | 290             | 150*       | 72378           | BELL #2   | 1.095          | 290   | 290   | 150* | 71394 | DIGHTON  | 0.976  | 185   | 185   | 8    |    |   |
| 71719            | POTTER     | 1.029 | 89              | 89              | -10        | 71743           | TAU_9A,8  | 1 073          | 55    | 55    | 34*  | 71744 | TAUNT_G9 | 1.049  | 85    | 85    | 52*  |    |   |
| 70909            | EDGR-GT1   | 1.035 | 215             | 215             | 18         | 70910           | EDGR-GT2  | 1.035          | 215   | 215   | 18   | 70911 | EDGR-ST1 | 1.035  | 276   | 276   | 24   |    |   |
| 71069            | MAPR1_PP   | 0.000 | 106             | 0               | 0          | 73070           | MAPR2_PP  | 0.000          | 106   | 0     | 0    | 73071 | MAPR3_PP | 0.000  | 95    | 0     | 0    |    |   |
| 72669            | TIVER_G1   | 1.023 | 189             | 189             | 17         | 72670           | TIVER_G2  | 1 025          | 92    | 92    | 9    | 71251 | CANAL_G1 | 1.035  | 566   | 587   | 239* |    |   |
| 71252            | CANAL_G2   | 1 014 | 576             | 580             | 120*       | 71094           | PLGRM_G1  | 1.038          | 734   | 734   | 174  | 70825 | MYS-GT11 | 0.000  | 215   | 0     | 0    |    |   |
| 70826            | MYS-GT12   | 0.000 | 215             | 0               | 0          | 70827           | MYS-ST13  | 0 000          | 310   | 0     | 0    | 70822 | MYS-ST10 | 1.053  | 276   | 276   | 39   |    |   |
| 70823            | MYST-GT9   | 1 054 | 215             | 215             | 39         | 70824           | MYST-GT8  | 1.054          | 215   | 215   | 39   | 71060 | MYST_G4  | 0.000  | 133   | 0     | 0    |    |   |
| 71061            | MYST_G5    | 0 000 | 129             | 0               | 0          | 71062           | MYST_G6   | 0.000          | 136   | 0     | 0    | 71063 | MYST_G7  | 1.043  | 565   | 565   | 295  |    |   |
| 71074            | N.BOST /   | 1.040 | 380             | 350             | 220*       | 71946           | SALEM_G1  | 1.017          | 81    | 81    | 32*  | 71947 | SALEM_G2 | 1.016  | 78    | 78    | 29*  |    |   |
| 71948            | SALEM_G3   | 1.012 | 143             | 143             | 50*        | 71949           | SALEM_G4  | 0.000          | 400   | 0     | 0    | 71126 | KEND_CT  | 1.035  | 187   | 187   | 22   |    |   |
| 71123            | KENDALL    | 1.015 | 63              | 63              | 32*        | 71124           | KND_JETS  | 1.018          | 40    | 20    | 3    | 91785 | TEWK-CT3 | 0.000  | 215   | 0     | 0    |    |   |
| 91786            | TEWK-CT2   | 0.000 | 215             | 0               | 0          | 91787           | TEWK-CT1  | 0.000          | 215   | 0     | 0    | 91814 | AES-CT1  | 1.048  | 280   | 279   | 56   |    |   |
| 91815            | AES-CT2    | 1 046 | 280             | 279             | 53         | 91816           | AES-ST    | 1.041          | 280   | 280   | 41   | 91972 | LOWELL   | 0.000  | 98    | 0     | 0    |    |   |
| 73072            | ALT12_PP   | 1.035 | 65              | 65              | 23         | 73073           | ALT34_PP  | 1.034          | 81    | 81    | 23   | 71945 | RESCO    | 1.036  | 33    | 33    | 20*  |    |   |
| 70010            | CONED_G1   | 1.018 | 169             | 169             | 78         | 70011           | CONED_G2  | 1 018          | 169   | 169   | 78   | 70012 | CONED_G3 | 1.014  | 195   | 195   | 78   |    |   |
| 72869            | %BRK_G1    | 1.028 | 1150            | 1150            | 550*       | 72868           | NWNGT_G1  | 1.000          | 422   | 422   | 78   | 72870 | SCHILLER | 0 000  | 50    | 0     | 0    |    |   |
| 12871            | %CHILLER   | 0.000 | 50              | 0               | 0          | 72872           | SCHILLER  | 0.956          | 50    | 50    | 25*  | 72866 | MERM_G1  | 1.052  | 113   | 113   | 49   |    |   |
| 12867            | MERMK_G2   | 1.052 | 320             | 320             | 140        | 70365           | WF_WY     | #1             | 1 021 | 57    | 57   | 12    | 70366    | WF_WY  | #2    | 0 000 | 57   | 0  | 0 |
| 10367            | WF_WY      | #1    | 020             | 125             | 24         | 70368           | WF_WY     | #1             | 1 044 | 636   | 636  | 242*  | 70377    | AEC_G1 | 1.040 | 58    | 58   | 10 |   |
| 70378            | AEC_G2     | 1.040 | 58              | 58              | 10         | 70379           | AEC_G3    | 1.040          | 58    | 58    | 10   | 70381 | RPA_CG1  | 0.000  | 179   | 0     | 0    |    |   |
| 70382            | RPA_G62    | 0.000 | 94              | 0               | 0          | 70060           | MIS_GT1   | 1.078          | 179   | 179   | 81   | 70061 | MIS_GT2  | 1.078  | 179   | 179   | 81   |    |   |
| 70062            | MIS_ST     | 1 077 | 191             | 191             | 81         | 70389           | BUCKS_G4  | 1 040          | 191   | 191   | 58   | 70705 | VTYAK_G  | 0.962  | 563   | 563   | 150* |    |   |
| 70386            | WBK_G1     | 1.040 | 185             | 185             | 40         | 70387           | WBK_G2    | 1.040          | 185   | 185   | 40   | 70388 | WBK_G3   | 1.040  | 196   | 196   | 43   |    |   |
| 73083            | NRTNHD12   | 0.988 | 540             | 270             | 80         | 73084           | NRTNHD34  | 0 000          | 540   | 0     | 0    | 72512 | BRSWP_G1 | 1.003  | 294   | 294   | 93   |    |   |
| 72513            | BR5WP_G2   | 0.000 | 294             | 0               | 0          | 72243           | MILLENCNT | 1.024          | 273   | 273   | 79   | 72244 | MILLENST | 1.018  | 117   | 117   | 35   |    |   |
|                  | MW         | MX    |                 |                 |            |                 | MW        | MX             |       |       |      |       | MW       | MX     |       |       |      |    |   |
| MILLSTONE        | 2008       | 385   | MIDDLETOWN      | 750             | 337        | MONTVILLE       | 483       | 227            |       |       |      |       |          |        |       |       |      |    |   |
| NORWALK_HARBOR   | 330        | 31    | NEW_HAVEN_HBR   | 447             | 175        | BRIDGEPORT_HBR  | 545       | 307            |       |       |      |       |          |        |       |       |      |    |   |
| S_MEADOW_CRR-A-C | 77         | 0     | WALLINGFORD     | 0               | 0          | TOWANTIC        | 0         | 0              |       |       |      |       |          |        |       |       |      |    |   |
| DEVON            | 214        | 94    | BRAYTON_POINT   | 1030            | 227        | MANCHESTER_ST   | 449       | 91             |       |       |      |       |          |        |       |       |      |    |   |
| SOMERSET         | 174        | 0     | OCEAN_STATE_PWR | 416             | 66         | BE-CT           | 0         | 0              |       |       |      |       |          |        |       |       |      |    |   |
| HOPE_ENERGY      | 545        | 203   | NEA_BELLINGHAM  | 301             | 135        | CANAL           | 1167      | 359            |       |       |      |       |          |        |       |       |      |    |   |
| SITHE-MYSTIC345  | 706        | 118   | MYSTIC_4656     | 0               | 0          | SITHE-MYSTIC115 | 0         | 0              |       |       |      |       |          |        |       |       |      |    |   |
| KENDALL_13.8     | 83         | 35    | KENDALL_REPOWER | 187             | 22         | GE-ALT1         | 146       | 47             |       |       |      |       |          |        |       |       |      |    |   |
| SITHE-EDGAR      | 706        | 59    | POTTER-MA       | 89              | -10        | TAUNTON-MA      | 140       | 86             |       |       |      |       |          |        |       |       |      |    |   |
| SALEM_HARBOR     | 302        | 111   | ANDROSCOGGIN_EC | 173             | 30         | RPA             | 0         | 0              |       |       |      |       |          |        |       |       |      |    |   |
| WESTHROOK-ME     | 565        | 123   | M.I.S_-ME       | 549             | 242        | NU-NEWINGTON    | 422       | 78             |       |       |      |       |          |        |       |       |      |    |   |
| CONED-NEWINGTON  | 533        | 234   | COMERFORD-NH    | 133             | 25         | MOORE-NH        | 139       | 32             |       |       |      |       |          |        |       |       |      |    |   |
| SCHILLER-NH      | 50         | 25    | MERRIMACK-NH    | 433             | 189        | AES-LONDONDERRY | 837       | 150            |       |       |      |       |          |        |       |       |      |    |   |
| UAE-TWEKSURY     | 0          | 0     | WYMAN           | 818             | 278        | BEAR_SWAMP      | 294       | 93             |       |       |      |       |          |        |       |       |      |    |   |
| NORTHFIELD       | 270        | 80    | STONY_BROOK     | 412             | 109        | MASS_POWER      | 0         | 0              |       |       |      |       |          |        |       |       |      |    |   |
| ANP-BELLINGHAM   | 580        | 300   | ANP-BLACKSTONE  | 580             | 229        | EMI-TIVERTON    | 281       | 26             |       |       |      |       |          |        |       |       |      |    |   |
| MILLNNIUM        | 390        | 114   | IDC-BELLINGHAM  | 0               | 0          | MILFORD_PWR-CT  | 153       | 80             |       |       |      |       |          |        |       |       |      |    |   |
| INTERFACE FLOWS  |            |       |                 |                 |            |                 |           |                |       |       |      |       |          |        |       |       |      |    |   |
| NB-NE            | 700        | 700   | -43             | MEYANKE-SOUTH   | 1350       | 620             | -108      | MAINE-NH       | 1400  | 1333  | -57  |       |          |        |       |       |      |    |   |
| NNE-5COBIE+394   | 2550       | 2738  | 290             | SEABROOK-SOUTH  | 1400       | 1619            | 331       | NORTH-SOUTH    | 3000  | 2857  | 15   |       |          |        |       |       |      |    |   |
| CMFO/MOORF-SO    | 920        | 150   | 16              | SNDYPOND-SOUTH  | 4000       | 2356            | 31        | CONN_EXPORT    | 2100  | -1842 | 106  |       |          |        |       |       |      |    |   |
| CONN-MASS        | ***        | -803  | 162             | CONN-RI         | ***        | -797            | 20        | SW_CONN_IMPORT | 1700  | 2251  | 27   |       |          |        |       |       |      |    |   |
| BOSTON_IMPORT    | 2600       | 3682  | -16             | NEMA/BOS_IMPORT | 3200       | 4239            | 34        | SEMA/RI_EXPORT | 1900  | 2592  | 123  |       |          |        |       |       |      |    |   |
| SEMA_EXPORT      | 1400       | 870   | -200            | GREATER RI EXP  | ***        | 1729            | 272       | CONVEX-REMVEC  | ***   | -1914 | 180  |       |          |        |       |       |      |    |   |
| EAST-WEST        | 2000(2200) | 2416  | 128             | NY-NE           | 2200(1700) | -40             | 14        | PV-20          | ***   | 85    | -4   |       |          |        |       |       |      |    |   |

HVDC TRANSFERS FROM H-Q

|                |                |                |
|----------------|----------------|----------------|
| CHAT-1 = 0     | CHAT-2 = 0     | HIGHGATE = 215 |
| MADAWASK = 150 | PHII-P1 = 1000 | PHII-P2 = 1000 |

BUS VOLTAGES

|                 | V LMT     |                | V LMT          |                 | V LMT          |                |          |
|-----------------|-----------|----------------|----------------|-----------------|----------------|----------------|----------|
| 70001 CHESTER   | 345 342.  | 70002 ORRINGTN | 345 347.       | 70027 ORRINGTN  | 115 120.       |                |          |
| 70003 MAXCYS    | 345 341.  | 70170 BOWMAN   | 115 120.       | 70003 MAXCYS    | 345 341.       |                |          |
| 70120 MAXCYS    | 115 122 H | 70512 ESX B-2  | 115 114. L     | 70086 ME YANK   | 345 343.       |                |          |
| 70087 SUROWIEC  | 345 344   | 70090 BUXTON   | 345 347.       | 72692 NWGTN345  | 345 357.       |                |          |
| 72694 SEBRK345  | 345 357.  | 70487 COOL 345 | 345 348.       | 71789 TEWKS     | 345 356.       |                |          |
| 70759 MYSTIC    | 345 360.  | 71797 MILLBURY | 345 354.       | 72925 LUDLOW    | 345 346.       |                |          |
| 72926 NRTHEFLD  | 345 350.  | 73106 SOUTHGTN | 345 349.       | 73108 CARD      | 345 352.       |                |          |
| 73109 MONTVILLE | 345 357.  | 73110 MILLSTNE | 345 357.       | 73116 MIDDLETWN | 345 356.       |                |          |
| /1801 BRAYTN P  | 345 358.  | 71811 KENT CO. | 345 353.       | 71336 SHERMAN   | 345 355.       |                |          |
| 71338 GS POWER  | 345 355.  | 71337 WFARNUM  | 345 354.       | 70772 W MEDWAY  | 345 356.       |                |          |
| 70780 WWALP345  | 345 355.  | 70783 PILGRIM  | 345 358.       | 70773 NEA 336   | 345 358.       |                |          |
| 71193 CANAL     | 345 357.  | 71133 CARVER   | 345 355.       | 70795 FRMNGHAM  | 230 235.       |                |          |
| 70818 MYSTC MA  | 115 121.  | 70900 HOLBROOK | 115 118.       | 70901 EDGAR     | 115 119.       |                |          |
| /1891 SALEM HR  | 115 117.  | 72096 MILLBURY | 115 110.       | 0.0             | 71377 SOMERSET | 115 116.       |          |
| 72277 MIDWEYMT  | 115 118.  | 71403 WFARNUM  | 115 116.       | 72584 HARTAVE   | 115 119.       |                |          |
| 72544 JOHNSTN1  | 115 119   | 0.0            | 72545 JOHNSTN2 | 115 119.        | 0.0            | 72560 DRUMROCK | 115 117. |
| 72565 KENT CO   | 115 117.  | 0 0            | 72572 W.KNGST  | 115 113.        | 0.0            |                | 0.0      |

AREA/ZONE TOTALS

|            |       |             |       |             |     |            |       |
|------------|-------|-------------|-------|-------------|-----|------------|-------|
| NEPOOL_GEN | 26074 | NEPOOL_LOAD | 28183 | NEPOOL_LOSS | 824 | NEPOOL_INT | -2941 |
|------------|-------|-------------|-------|-------------|-----|------------|-------|

## **APPENDIX C-1 – LIST OF CONTINGENCIES**

**SINGLE-CONTINGENCY OUTAGES OF LINES, TRANSFORMERS, AND GENERATORS**

**A. Transformer Outages**

| Cont No. | From Bus | Name               | To Bus | Name                 | Transformer I.D.       |
|----------|----------|--------------------|--------|----------------------|------------------------|
| T1       | 70759    | Mystic 345kV       | 70818  | Mystic 115kV         | Mystic 345A Auto       |
| T2       | 70758    | North Cambridge    | 70815  | North Cambridge      | North Cambridge 345A   |
| T3       | 70756    | Woburn 345kV       | 70799  | Woburn 115kV         | Woburn 345A Auto       |
| T4       | 70766    | Kingston St. 345kV | 70830  | Kingston St. A 115kV | Kingston St. 345A Auto |
| T5       | 70795    | Framingham 230kV   | 70870  | Framingham 115kV     | Framingham 230A Auto   |

**B. 345kV Line Outages**

| Cont No. | From Bus | Name                | To Bus | Name                | Line I.D.     |
|----------|----------|---------------------|--------|---------------------|---------------|
| 345-1    | 70759    | Mystic 345kV        | 70766  | Kingston St. 345kV  | 372           |
| 345-2    | 70759    | Mystic 345kV        | 71781  | Golden Hills 345kV  | 349XY         |
| 345-3    | 70756    | Woburn 345kV        | 70758  | No. Cambridge 345kV | 346           |
| 345-4    | 71781    | Golden Hills 345kV  | 71789  | Tewksbury 345kV     | 339           |
| 345-5    | 71789    | Tewksbury 345kV     | 71786  | Sandy Pond 345kV    | 337           |
| 345-6    | 71789    | Tewksbury 345kV     | 70756  | Woburn 345kV        | 338           |
| 345-7    | 70758    | No. Cambridge 345kV | 70759  | Mystic 345kV        | 358           |
| 345-8    | 71789    | Tewksbury 345kV     | 71790  | Ward Hill 345kV     | 394E          |
| 345-9    | 70786    | New Canton Tap 345  | 70787  | New Hyde Park 345   | New 345-1     |
|          | 70787    | New Hyde Park 345   | 70788  | New Dewar 345       | Line          |
|          | 70788    | New Dewar 345       | 70862  | New K-Street 345    | +<br>New K-St |
|          | 70862    | New K-Street 345    | 70836  | K-Street 115-1      | Auto          |

**C. 115 kV Line Outages – NSTAR-North**

| <b>Cont No.</b> | <b>From Bus</b>                           | <b>Name</b>                                                                          | <b>To Bus</b>                             | <b>Name</b>                                                                                   | <b>Line Number</b> |
|-----------------|-------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------|
| 115-1           | 70887<br>70854<br>70854<br>70852<br>70852 | Baker Street<br>Washington Tap<br>Washington Tap<br>Colburn Street<br>Colburn Street | 70854<br>70813<br>70852<br>70831<br>88852 | Washington Tap<br>Brighton Bus A<br>Colburn Street<br>Kingston St Bus A<br>Colburn 510 14.4kV | 110-510            |
| 115-2           | 70888                                     | Baker Street                                                                         | 70893                                     | Needham                                                                                       | 110-522            |
| 115-3           | 70893                                     | Needham                                                                              | 70894                                     | Dover                                                                                         | 148-522XY-East     |
| 115-4           | 70894                                     | Dover                                                                                | 70895                                     | West Walpole                                                                                  | 148-522XY-West     |
| 115-5           | 70799                                     | Woburn 115kV                                                                         | 70818                                     | Mystic 115kV                                                                                  | 211-514            |
| 115-6           | 70870                                     | Framingham                                                                           | 70868                                     | Sherborn                                                                                      | 240-508            |
| 115-7           | 70888<br>70907<br>70907                   | Baker Street<br>Needham Tap<br>Needham Tap                                           | 70907<br>70870<br>70893                   | Needham Tap<br>Framingham<br>Needham                                                          | 240-510            |
| 115-8           | 70793                                     | Mid-Framingham 230                                                                   | 70795                                     | Framingham                                                                                    | 240-601            |
| 115-9           | 70818<br>70844<br>70842                   | Mystic Old<br>Hawkins Street 516<br>Chatham Street 516                               | 70844<br>70842<br>70837                   | Hawkins Street 516<br>Chatham Street 516<br>K-Street #2                                       | 250-516            |
| 115-10          | 70810                                     | Waltham PS                                                                           | 70872                                     | Sudbury                                                                                       | 282-507            |
| 115-11          | 70809<br>70811                            | Waltham Ring<br>Watertown                                                            | 70811<br>70814                            | Watertown<br>Brighton B                                                                       | 282-520            |
| 115-12          | 70789                                     | Waltham 230                                                                          | 70794                                     | Medway 230 (LV of 345A)                                                                       | 282-602            |
| 115-13          | 70809                                     | Waltham PS                                                                           | 70807                                     | Trapelo A                                                                                     | 320-508            |
| 115-14          | 70813<br>70816                            | Brighton A 115kV<br>Somerville #402                                                  | 70816<br>70818                            | Somerville #402<br>Mystic 115kV                                                               | 329-510            |
| 115-15          | 70813<br>70850<br>70848                   | Brighton A<br>Scotia Street A<br>Carver Street A                                     | 70850<br>70848<br>70830                   | Scotia Street A<br>Carver Street A<br>Kingston Street A                                       | 329-512            |

**C. 115 kV Line Outages – NSTAR-North (con't)**

| Cont No. | From Bus | Name              | To Bus | Name                     | Line Number    |
|----------|----------|-------------------|--------|--------------------------|----------------|
| 115-16   | 70815    | No. Cambridge     | 70813  | Brighton A               | 329-530        |
| 115-17   | 70871    | Speen Street      | 70872  | Sudbury Ring             | 342-507        |
| 115-18   | 70831    | Kingston Street B | 70832  | Kingston Network Station | 385-510        |
|          | 70832    | Kingston Network  | 70995  | Kingston 14.4 #1         |                |
|          | 70832    | Kingston Network  | 70995  | Kingston 14.4 #2         |                |
|          | 70832    | Kingston Network  | 70835  | High Street B            |                |
|          | 70835    | High Street B     | 70996  | High Street 14.4 #1      |                |
|          | 70835    | High Street B     | 70996  | High Street 14.4 #2      |                |
|          | 70835    | High Street B     | 70837  | K-Street 2               |                |
| 115-19   | 70830    | Kingston Street A | 70836  | K-Street 2               | 385-512        |
| 115-20   | 70818    | Mystic New        | 71883  | Everett #423             | O-167/ 423-515 |
| 115-21   | 70870    | Framingham Ring   | 70871  | Speen Street             | 433-507        |
| 115-22   | 70868    | Sherborn          | 70869  | West Framingham          | 455-507        |
| 115-23   | 70818    | Mystic New        | 70819  | Chelsea #488             | 488-518        |

**D. 115kV Line Outages – National Grid**

| Cont No. | From Bus | Name                | To Bus | Name                | Line Number |
|----------|----------|---------------------|--------|---------------------|-------------|
| 115-1    | 71883    | Everett #37         | 71886  | Maplewood #16       | F-158S      |
| 115-2    | 71886    | Maplewood #16       | 71884  | Golden Hills #1884  | F-158N      |
| 115-3    | 71886    | Maplewood #16       | 71876  | Golden Hills Tap 69 | Q-169       |
|          | 71876    | Golden Hills Tap 69 | 71884  | Golden Hills #1884  |             |
|          | 71876    | Golden Hills Tap 69 | 71903  | Melrose #2          |             |
| 115-4    | 70901    | Edgar Station       | 72281  | Field Street #2     | 517-533N    |
|          | 72281    | Field Street #2     | 72283  | North Quincy #2     | + 517-533S  |

**E. 230kV Line Outages**

| Cont No. | From Bus | Name           | To Bus | Name        | Line Number |
|----------|----------|----------------|--------|-------------|-------------|
| 230-1    | 795      | Framingham 230 | 793    | Medway 230B | 240-601     |
| 230-2    | 789      | Waltham 230    | 794    | Medway 230A | 282-602     |

**F. Generator Outages**

| Cont No. | Generator Name                    | Interconnection Voltage | Total Contingency MW |
|----------|-----------------------------------|-------------------------|----------------------|
| G1       | Exelon Block 8 (GT8, GT9, ST10)   | 345kV                   | 700                  |
| G2       | Exelon Block 9 (GT11, GT12, ST13) | 115kV                   | 700                  |
| G3       | Kendall Combustion Turbine #4     | 115kV                   | 187                  |
| G4       | Mystic #7                         | 345kV                   | 565                  |
| G5       | Salem Harbor #3                   | 115kV                   | 81                   |
| G6       | Seabrook G1                       | 345kV                   | 1,150                |

## **APPENDIX C-2 – DESCRIPTIONS OF STUCK BREAKER CONTINGENCIES**

## **DESCRIPTIONS OF 345kV BREAKER FAILURE CONTINGENCIES**

### **Mystic 345kV Station #250**

MYSB 101 (Series Breaker): No Lines interrupted for failure of one module.

MYSB 102: Clears Line 349XY to Golden Hills.  
Clears Line 372 to Kingston Street.

MYSB 103: Clears Line 372 to Kingston Street.  
Clears Line to Mystic Unit #7.

MYSB 104: Clears Line to Mystic Unit #7.  
Clears Mystic Autotransformer 345A.

MYSB 105: Clears Mystic Autotransformer 345A.  
Clears Line 358 To North Cambridge.

MYSB 106 (Series Breaker): No Lines interrupted for failure of one module.

MYSB 107 (Series Breaker): No Lines interrupted for failure of one module.

MYSB 108: Clears Line 324 to Kingston Street.  
Clears Line 351 to North Cambridge.

MYSB 109: Clears Mystic Autotransformer 345A.  
Clears Line 351 to North Cambridge.

### **North Cambridge 345kV Station #509**

NCSB 101: Clears Autotransformer 345B.  
Clears Line 365 to Woburn.

NCSB 102: Clears Autotransformer 345B.  
Clears Line 358 to Mystic.

NCSB 103: Clears Line 358 to Mystic.  
Clears Autotransformer 345A.

NCSB 105: Clears Autotransformer 345A.  
Clears Line 346 to Woburn.

NCSB 107: Clears Line 346 to Woburn.  
Clears Line 351 to Mystic.

NCSB 108: Clears Line 351 to Mystic.  
Clears Line 365 to Woburn.

### **Woburn 345kV Station #211**

- WBSB 101: Clears Woburn 345A Autotransformer.  
Clears Line 338 to Tewksbury.
- WBSB 102: Clears Woburn 345A Autotransformer.  
Clears Line 346 to North Cambridge.
- WBSB 103: Clears Line 346 to North Cambridge.  
Clears Line 319 and Lexington 345A Autotransformer.
- WBSB 104: Clears Line 319 and Lexington 345A Autotransformer.  
Clears Line 365 to North Cambridge.
- WBSB 106: Clears Line 365 to North Cambridge.  
Clears Line 339 to Tewksbury.

### **Tewksbury 345kV Station (National Grid)**

- TKSB 37-39: #337 Opens Line 337 to Sandy Pond. SP Breakers #9126 and #911 open at remote end.  
#339 Opens Line 339 to Golden Hills.  
Golden Hills 345kV Breaker #339 opens at remote end.  
Golden Hills 115kV Breakers open to isolate Golden Hills Auto #T1.
- TKSB 38-94: #338 Opens Line 338 to Woburn. Transfer Trip Clears Remote End.  
#394 Opens Line 394E to Ward Hill. (This assumes that the second Ward Hill Autotransformer is in service and a new 345kV ring bus is in place at Ward Hill to sectionalize Line 394 into East and West sections.)

### **Golden Hills 345kV Station (National Grid)**

- GHSB 349: #3949 Opens Line 349XY to Mystic.  
115kV Breaker Clears T2 Auto From Secondary Side.
- GHSB 39-49: #349 Opens Line 349XY to Mystic.  
#339 Directly In Series With #3949 - No Additional Lines Cleared.
- GHSB 339: #3949 Opens Line 349XY to Mystic.  
115kV Breaker Clears T1 Auto From Secondary Side.

**APPENDIX D-1. TABULAR RESULTS –**  
**MYSTIC BLOCK 9 & NEW BOSTON OFF**

| Boston Area Generation Dispatch              |                                  | Thermal Results With Mystic Block 9 & New Boston OFF (% Normal Rating) |      |      |      |      |      |
|----------------------------------------------|----------------------------------|------------------------------------------------------------------------|------|------|------|------|------|
| Circuit Element                              | Normal (Continuous) Rating (MVA) | Condition                                                              | 2004 | 2005 | 2006 | 2007 | 2008 |
| Mystic 345A Autotransformer                  | 360                              | All Lines In                                                           | 98   | 98   | 101  | 106  | 108  |
| Kingston Street 345A Autotransformer         | 485                              | All Lines In                                                           | 100  | 96   | 100  | 104  | 106  |
| Kingston Street 345B Autotransformer         | 503                              | All Lines In                                                           | 96   |      | 96   | 100  | 102  |
| 115kV Cable 282-520 (Waltham - Watertown)    | 120                              | All Lines In                                                           |      |      | 96   |      | 98   |
| 115kV Cable 385-510 (Kingston - High Street) | 154                              | All Lines In                                                           | 104  | 103  | 105  | 107  | 109  |
| 115kV Cable 385-511 (Kingston - High Street) | 154                              | All Lines In                                                           | 103  | 102  | 104  | 106  | 108  |
| 115kV Line 240-508 (Sherborn - W.Framingham) | 227                              | All Lines In                                                           |      |      |      |      | 95   |
| 115kV Cable 292-523 (Baker St - Newton110AB) | 120                              | All Lines In                                                           |      |      |      | 95   | 97   |
| 115kV Line 447-508 (Holbrook - S.Randolph)   | 227                              | All Lines In                                                           |      |      | 97   | 98   | 99   |

Table D-1(a). “All-Lines-In” Loading Violations– Block 9 & New Boston OFF (pg 1 of 1)

| <b>Boston Area Generation Dispatch</b> |                        | <b>Voltage Results With Mystic Block 9 &amp; New Boston OFF (% Normal Rating)</b> |             |             |             |             |             |                                      |  |
|----------------------------------------|------------------------|-----------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|--------------------------------------|--|
| <b>Station Bus</b>                     | <b>Nominal Voltage</b> | Modeled NEPOOL Load+Losses (MW):                                                  |             | 27,406      | 27,713      | 28,105      | 28,608      | 29,022                               |  |
|                                        |                        | Modeled NSTAR-North Load (MW):                                                    |             | 4,055       | 4,099       | 4,207       | 4,291       | 4,366                                |  |
|                                        |                        | Modeled NSTAR-North Load (MVA):                                                   |             | 4,274       | 4,320       | 4,434       | 4,523       | 4,602                                |  |
|                                        |                        | Boston Import Level (MW):                                                         |             | 3,591       | 3,675       | 3,819       | 3,941       | 4,042                                |  |
|                                        |                        | <b>Condition</b>                                                                  | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b> |                                      |  |
| All NSTAR-North Transmission Stations  |                        | All Lines In                                                                      |             |             |             |             |             | No Voltage Violations For Any Years. |  |

Table D-1(b). “All-Lines-In” Voltage Violations – Block 9 & New Boston OFF (pg 1 of 1)

| <b>Boston Area Generation Dispatch</b>                                                                                                                                              |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b>                                                      |                                   |                                   |                                   |                                   |                                   |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------|
| <b>Circuit Element</b>                                                                                                                                                              | <b>L.T.E.</b> | <b>Contingency</b>                                                                                                                 | <b>Condition</b>                  | <b>2004</b>                       | <b>2005</b>                       | <b>2006</b>                       | <b>2007</b>                       | <b>2008</b> |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1, Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2, MBTA, Fram, L-St, Potter, RESCO, GE-Lynn, (Mystic 4,5,6, New Boston, and Block 9 OFF) |               | Modeled NEPOOL Load+Losses (MW):<br>Modeled NSTAR-North Load (MW):<br>Modeled NSTAR-North Load (MVA):<br>Boston Import Level (MW): | 27,406<br>4,055<br>4,274<br>3,591 | 27,713<br>4,099<br>4,320<br>3,675 | 28,105<br>4,207<br>4,434<br>3,819 | 28,608<br>4,291<br>4,523<br>3,941 | 29,022<br>4,366<br>4,602<br>4,042 |             |
| 345kV Cable 365 (Woburn-No.Cambridge)                                                                                                                                               | 751           | WOBURN SB103                                                                                                                       | Pre-Cont.<br>Post-Cont:           |                                   |                                   |                                   | 39                                | 42          |
| 345kV Cable 372 (Mystic-Kingston Street)                                                                                                                                            | 844           | MYSTIC SB108                                                                                                                       | Pre-Cont.<br>Post-Cont:           | 55<br>109                         | 53<br>105                         | 55<br>109                         | 96                                | 99          |
| 345kV Cable 324 (Mystic-Kingston Street)                                                                                                                                            | 844           | CABLE 372                                                                                                                          | Pre-Cont.<br>Post-Cont:           | 55<br>109                         | 53<br>106                         | 55<br>109                         | 57                                | 59          |
|                                                                                                                                                                                     |               | MYSTIC SB102                                                                                                                       | Pre-Cont.<br>Post-Cont:           | 55<br>108                         | 53<br>104                         | 55<br>108                         | 113                               | 116         |
|                                                                                                                                                                                     |               | MYSTIC SB103                                                                                                                       | Pre-Cont.<br>Post-Cont:           | 55<br>103                         | 53<br>99                          | 55<br>103                         | 58                                |             |
| Mystic 345A Autotransformer                                                                                                                                                         | 407           | 240-601+282-602 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           | 87<br>100                         | 87<br>98                          | 89<br>102                         | 93<br>107                         |             |
|                                                                                                                                                                                     |               | 282-602+282-507 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           |                                   |                                   | 89                                | 93                                | 95          |
|                                                                                                                                                                                     |               | 282-602+433-507 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           | 87<br>99                          |                                   | 89<br>101                         | 99                                | 102         |
|                                                                                                                                                                                     |               | CABLE 329-530                                                                                                                      | Pre-Cont.<br>Post-Cont:           |                                   |                                   | 92                                | 95                                |             |
|                                                                                                                                                                                     |               | KENDALL CT#4                                                                                                                       | Pre-Cont.<br>Post-Cont:           |                                   |                                   | 96                                | 100                               |             |
|                                                                                                                                                                                     |               | KINGSTON 345A                                                                                                                      | Pre-Cont.<br>Post-Cont:           | 87<br>108                         | 89<br>110                         | 93<br>115                         | 95<br>119                         |             |
|                                                                                                                                                                                     |               | LINE 148-522XY-E                                                                                                                   | Pre-Cont.<br>Post-Cont:           |                                   |                                   | 93                                | 96                                |             |
|                                                                                                                                                                                     |               | LINE 148-522XY-W                                                                                                                   | Pre-Cont.<br>Post-Cont:           |                                   |                                   | 98                                | 102                               |             |
|                                                                                                                                                                                     |               |                                                                                                                                    |                                   |                                   |                                   | 95                                |                                   |             |
|                                                                                                                                                                                     |               |                                                                                                                                    |                                   |                                   |                                   | 102                               |                                   |             |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 1 of 11)**

| <b>Boston Area Generation Dispatch</b> |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b> |                         |             |             |             |             |             |
|----------------------------------------|---------------|-------------------------------------------------------------------------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| <b>Circuit Element</b>                 | <b>L.T.E.</b> | <b>Contingency</b>                                                            | <b>Condition</b>        | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b> |
| Mystic 345A Autotransformer (cont)     | 407           | LEXINGTON 345A                                                                | Pre-Cont.<br>Post-Cont: | 87<br>95    |             | 89<br>99    | 93<br>102   | 95<br>106   |
|                                        |               | LINE 211-508                                                                  | Pre-Cont.<br>Post-Cont: |             |             |             |             | 95          |
|                                        |               | LINE 240-601                                                                  | Pre-Cont.<br>Post-Cont: |             |             |             | 93          | 95          |
|                                        |               | LINE 282-602                                                                  | Pre-Cont.<br>Post-Cont: |             |             | 89          | 93          | 95          |
|                                        |               | LINE 319                                                                      | Pre-Cont.<br>Post-Cont: | 87<br>95    |             | 89<br>99    | 93<br>102   | 103         |
|                                        |               | LINE 433-507                                                                  | Pre-Cont.<br>Post-Cont: |             |             |             | 95          | 106         |
|                                        |               | N.CAMB SB101                                                                  | Pre-Cont.<br>Post-Cont: | 86<br>95    |             | 89<br>97    | 92<br>102   | 96<br>106   |
|                                        |               | N.CAMB SB102                                                                  | Pre-Cont.<br>Post-Cont: | 86<br>96    |             | 89<br>98    | 93<br>103   | 95<br>106   |
|                                        |               | N.CAMB SB103                                                                  | Pre-Cont.<br>Post-Cont: | 87<br>96    |             | 89<br>98    | 92<br>103   | 96<br>106   |
|                                        |               | N.CAMB SB104                                                                  | Pre-Cont.<br>Post-Cont: | 87<br>95    |             | 89<br>97    | 93<br>102   | 95<br>106   |
|                                        |               | NO.CAMB 345A                                                                  | Pre-Cont.<br>Post-Cont: | 87<br>95    |             | 89<br>98    | 93<br>103   | 96<br>106   |
|                                        |               | W. MEDWAY 345B                                                                | Pre-Cont.<br>Post-Cont: |             |             | 89<br>96    | 93<br>99    | 95<br>102   |

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 2 of 11)**

| <b>Boston Area Generation Dispatch</b> |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b> |                         |             |             |
|----------------------------------------|---------------|-------------------------------------------------------------------------------|-------------------------|-------------|-------------|
| <b>Circuit Element</b>                 | <b>L.T.E.</b> | <b>Contingency</b>                                                            | <b>Condition</b>        | <b>2004</b> | <b>2005</b> |
|                                        |               |                                                                               |                         | <b>2006</b> | <b>2007</b> |
| Mystic 345A Autotransformer (cont')    | 407           | W. WALPOLE 345A                                                               | Pre-Cont.<br>Post-Cont: | 92<br>96    | 96<br>100   |
|                                        |               | WOBURN 345A                                                                   | Pre-Cont.<br>Post-Cont: | 93<br>95    | 95<br>98    |
|                                        |               | WOBURN SB102                                                                  | Pre-Cont.<br>Post-Cont: | 95<br>96    | 96<br>98    |
|                                        |               | WOBURN SB103                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>98    | 93<br>102   |
| Kingston 345B Autotransformer          | 540           | 110-5222+240-510 DCT                                                          | Pre-Cont.<br>Post-Cont: | 89<br>98    | 93<br>105   |
|                                        |               | 240-601+282-602 DCT                                                           | Pre-Cont.<br>Post-Cont: | 89<br>104   | 90<br>103   |
|                                        |               | 282-602+282-507 DCT                                                           | Pre-Cont.<br>Post-Cont: | 89<br>95    | 90<br>96    |
|                                        |               | 282-602+433-507 DCT                                                           | Pre-Cont.<br>Post-Cont: | 89<br>102   | 89<br>101   |
|                                        |               | CABLE 329-530                                                                 | Pre-Cont.<br>Post-Cont: |             | 93<br>105   |
|                                        |               | KENDALL CT#4                                                                  | Pre-Cont.<br>Post-Cont: |             | 93<br>95    |
|                                        |               | KINGSTON 345A                                                                 | Pre-Cont.<br>Post-Cont: | 90<br>117   | 93<br>115   |
|                                        |               | LINE 148-522XY-E                                                              | Pre-Cont.<br>Post-Cont: | 90<br>95    | 93<br>99    |
|                                        |               | LINE 148-522XY-W                                                              | Pre-Cont.<br>Post-Cont: | 89<br>96    | 95<br>101   |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 3 of 11)**

| <b>Boston Area Generation Dispatch</b>                                                                                                                                                       |        | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b> |                         |           |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------|-------------------------|-----------|-----------|
|                                                                                                                                                                                              |        | Model NEPOOL Load+Losses (MW):                                                | 27,406                  | 27,713    | 28,105    |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1,<br>Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2,<br>MBTA, Fram, L-St, Potter, RESCO, GE-Lynn,<br>(Mystic 4,5,6, New Boston, and Block 9 OFF) |        | Modeled NSTAR-North Load (MW):                                                | 4,055                   | 4,099     | 4,207     |
|                                                                                                                                                                                              |        | Modeled NSTAR-North Load (MVA):                                               | 4,274                   | 4,320     | 4,434     |
|                                                                                                                                                                                              |        | Boston Import Level (MW):                                                     | 3,591                   | 3,675     | 3,819     |
| Circuit Element                                                                                                                                                                              | L.T.E. | Contingency                                                                   | Condition               | 2004      | 2005      |
| Kingston 345B Autotransformer (cont)                                                                                                                                                         | 540    | LEXINGTON 345A                                                                | Pre-Cont.<br>Post-Cont: | 89<br>99  | 90<br>99  |
|                                                                                                                                                                                              |        | LINE 211-508                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>92  | 89<br>92  |
|                                                                                                                                                                                              |        | LINE 240-601                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>95  | 90<br>94  |
|                                                                                                                                                                                              |        | LINE 282-602                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>96  | 90<br>96  |
|                                                                                                                                                                                              |        | LINE 319                                                                      | Pre-Cont.<br>Post-Cont: | 89<br>99  | 90<br>99  |
|                                                                                                                                                                                              |        | MYSTIC 345A                                                                   | Pre-Cont.<br>Post-Cont: | 89<br>105 | 87<br>101 |
|                                                                                                                                                                                              |        | MYSTIC SB104                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>100 | 90<br>99  |
|                                                                                                                                                                                              |        | MYSTIC SB105                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>106 | 90<br>105 |
|                                                                                                                                                                                              |        | N.CAMB SB101                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>99  | 90<br>99  |
|                                                                                                                                                                                              |        | N.CAMB SB102                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>99  | 89<br>98  |
|                                                                                                                                                                                              |        | N.CAMB SB103                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>99  | 90<br>98  |
|                                                                                                                                                                                              |        | N.CAMB SB104                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>99  | 89<br>98  |
|                                                                                                                                                                                              |        | NO.CAMB 345A                                                                  | Pre-Cont.<br>Post-Cont: | 89<br>99  | 90<br>98  |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 4 of 11)**

| <b>Boston Area Generation Dispatch</b>                                                                                                                                              |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b>                                                      |                                   |                                   |                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| <b>Circuit Element</b>                                                                                                                                                              | <b>L.T.E.</b> | <b>Contingency</b>                                                                                                                 | <b>Condition</b>                  | <b>2004</b>                       | <b>2005</b>                       |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1, Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2, MBTA, Fram, L-St, Potter, RESCO, GE-Lynn, (Mystic 4,5,6, New Boston, and Block 9 OFF) |               | Modeled NEPOOL Load+Losses (MW):<br>Modeled NSTAR-North Load (MW):<br>Modeled NSTAR-North Load (MVA):<br>Boston Import Level (MW): | 27,406<br>4,055<br>4,274<br>3,591 | 27,713<br>4,099<br>4,320<br>3,675 | 28,105<br>4,207<br>4,434<br>3,819 |
| Kingston 345B Autotransformer (cont)                                                                                                                                                | 540           | W. MEDWAY 345B                                                                                                                     | Pre-Cont.<br>Post-Cont:           | 89<br>96                          | 90<br>96                          |
|                                                                                                                                                                                     |               | W. WALPOLE 345A                                                                                                                    | Pre-Cont.<br>Post-Cont:           | 89<br>93                          | 90<br>93                          |
|                                                                                                                                                                                     |               | WOBURN 345A                                                                                                                        | Pre-Cont.<br>Post-Cont:           | 89<br>92                          | 90<br>93                          |
|                                                                                                                                                                                     |               | WOBURN SB102                                                                                                                       | Pre-Cont.<br>Post-Cont:           | 89<br>92                          | 92<br>95                          |
|                                                                                                                                                                                     |               | WOBURN SB103                                                                                                                       | Pre-Cont.<br>Post-Cont:           | 89<br>99                          | 89<br>102                         |
| West Medway 345A Autotransformer                                                                                                                                                    | 560           | 282-602+282-507 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           |                                   | 84<br>96                          |
|                                                                                                                                                                                     |               | LINE 337 + Y-151                                                                                                                   | Pre-Cont.<br>Post-Cont:           |                                   | 84<br>97                          |
|                                                                                                                                                                                     |               | LINE 337                                                                                                                           | Pre-Cont.<br>Post-Cont:           |                                   | 84<br>97                          |
|                                                                                                                                                                                     |               | TEWKS 37-39                                                                                                                        | Pre-Cont.<br>Post-Cont:           |                                   | 84<br>98                          |
|                                                                                                                                                                                     |               | TEWKS 37-39+151                                                                                                                    | Pre-Cont.<br>Post-Cont:           |                                   | 84<br>98                          |
|                                                                                                                                                                                     |               | W. WALPOLE 345A                                                                                                                    | Pre-Cont.<br>Post-Cont:           |                                   | 84<br>97                          |

Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 5 of 11)

| <b>Boston Area Generation Dispatch</b>    |               |                     | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of I.T.E.)</b> |             |             |             |             |             |  |
|-------------------------------------------|---------------|---------------------|-------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|-------------|--|
| <b>Circuit Element</b>                    | <b>L.T.E.</b> | <b>Contingency</b>  | <b>Condition</b>                                                              | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b> |  |
| 115kV Line 320-508 (Lexington-Trapelo Rd) | 140           | 240-601+282-602 DCT | Pre-Cont.                                                                     | 65          | 66          | 69          | 74          |             |  |
|                                           |               | 282-602+433-507 DCT | Post-Cont:                                                                    | 100         | 102         | 106         | 111         |             |  |
|                                           |               |                     | Pre-Cont.                                                                     | 65          | 69          | 74          |             |             |  |
|                                           |               |                     | Post-Cont:                                                                    | 105         | N/C         | 111         | 115         | N/C         |  |
| KINGSTON 345A                             |               | Pre-Cont.           |                                                                               |             |             |             |             |             |  |
|                                           |               | Post-Cont:          |                                                                               |             |             |             |             |             |  |
| LINE 320-507                              |               | Pre-Cont.           | 64                                                                            | 67          | 69          | 73          | 72          |             |  |
|                                           |               | Post-Cont:          | 102                                                                           | 103         | 107         | 113         | 113         |             |  |
| 115kV Line 320-507 (Lexington-Trapelo Rd) | 140           | 240-601+282-602 DCT | Pre-Cont.                                                                     | 65          | 66          | 69          | 74          |             |  |
|                                           |               | Post-Cont:          | 100                                                                           | 102         | 106         | 110         |             |             |  |
|                                           |               |                     | Pre-Cont.                                                                     | 65          | 69          | 74          |             |             |  |
|                                           |               |                     | Post-Cont:                                                                    | 105         | N/C         | 111         | 115         | N/C         |  |
| KINGSTON 345A                             |               | Pre-Cont.           |                                                                               |             |             |             |             |             |  |
|                                           |               | Post-Cont:          |                                                                               |             |             |             |             |             |  |
| 115kV Line 320-508 (Trapelo Road-Waltham) | 118           | 240-601+282-602 DCT | Pre-Cont.                                                                     | 62          | 66          | 71          | 72          |             |  |
|                                           |               | 282-602+433-507 DCT | Post-Cont:                                                                    | 100         | 103         | 105         | N/C         |             |  |
|                                           |               |                     | Pre-Cont.                                                                     |             |             |             |             |             |  |
|                                           |               |                     | Post-Cont:                                                                    |             |             |             |             |             |  |
| KINGSTON 345A                             |               | Pre-Cont.           |                                                                               |             |             |             |             |             |  |
|                                           |               | Post-Cont:          |                                                                               |             |             |             |             |             |  |
| LINE 320-507                              |               | Pre-Cont.           | 63                                                                            | 66          | 71          | 65          |             |             |  |
|                                           |               | Post-Cont:          | 105                                                                           | 111         | 118         | 109         |             |             |  |
| 115kV Line 320-509 (Trapelo Road-Waltham) | 118           | 240-601+282-602 DCT | Pre-Cont.                                                                     | 62          | 66          | 71          |             |             |  |
|                                           |               | 282-602+433-507 DCT | Post-Cont:                                                                    | 100         | 103         | 105         |             |             |  |
|                                           |               |                     | Pre-Cont.                                                                     |             |             |             |             |             |  |
|                                           |               |                     | Post-Cont:                                                                    |             |             |             |             |             |  |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 6 of 11)**

| <b>Boston Area Generation Dispatch</b>  |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b> |                         |           |      |        |      |        |  |        |  |        |     |
|-----------------------------------------|---------------|-------------------------------------------------------------------------------|-------------------------|-----------|------|--------|------|--------|--|--------|--|--------|-----|
|                                         |               | Modeled NEPOOL Load+Losses (MW):                                              |                         | 27,406    |      | 27,713 |      | 28,105 |  | 28,608 |  | 29,022 |     |
|                                         |               | Modeled NSTAR-North Load (MW):                                                |                         | 4,055     |      | 4,099  |      | 4,207  |  | 4,291  |  | 4,366  |     |
|                                         |               | Modeled NSTAR-North Load (MVA):                                               |                         | 4,274     |      | 4,320  |      | 4,434  |  | 4,523  |  | 4,602  |     |
|                                         |               | Boston Import Level (MW):                                                     |                         | 3,591     |      | 3,675  |      | 3,819  |  | 3,941  |  | 4,042  |     |
| <b>Circuit Element</b>                  | <b>L.T.E.</b> | <b>Contingency</b>                                                            | <b>Condition</b>        | 2004      | 2005 | 2006   | 2007 | 2008   |  |        |  |        |     |
| 115kV Cable 282-520 (Waltham-Watertown) | 152           | 282-602+433-507 DCT                                                           | Pre-Cont.<br>Post-Cont: | 58<br>103 |      | 75     | 77   |        |  |        |  |        |     |
|                                         |               | KINGSTON 345A                                                                 | Pre-Cont.<br>Post-Cont: |           |      | 74     | 76   | 75     |  |        |  |        | N/C |
|                                         |               | LINE 337 + Y-151                                                              | Pre-Cont.<br>Post-Cont: |           |      | 105    | 102  | 102    |  |        |  |        |     |
|                                         |               | LINE 337                                                                      | Pre-Cont.<br>Post-Cont: |           |      | 74     | 75   | 74     |  |        |  |        |     |
|                                         |               | MYSTIC SB104                                                                  | Pre-Cont.<br>Post-Cont: |           |      | 111    | 111  | 111    |  |        |  |        |     |
|                                         |               | TEWKS 37-39                                                                   | Pre-Cont.<br>Post-Cont: |           |      | 74     | 75   | 74     |  |        |  |        |     |
|                                         |               | TEWKS 37-39+151                                                               | Pre-Cont.<br>Post-Cont: |           |      | 110    | 111  | 111    |  |        |  |        |     |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 7 of 11)**

| <b>Boston Area Generation Dispatch</b>  |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b> |                         |             |             |             |             |             |
|-----------------------------------------|---------------|-------------------------------------------------------------------------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| <b>Circuit Element</b>                  | <b>L.T.E.</b> | <b>Contingency</b>                                                            | <b>Condition</b>        | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b> |
| 115kV Cable 282-521 (Waltham-Watertown) | 152           | CABLE 282-520                                                                 | Pre-Cont.<br>Post-Cont: | 60<br>97    | 66<br>107   | 77<br>125   | 78<br>127   | 78<br>126   |
|                                         |               | KINGSTON 345A                                                                 | Pre-Cont.<br>Post-Cont: |             |             | 77<br>108   | 78<br>106   | 78<br>108   |
|                                         |               | LINE 337 + Y-151                                                              | Pre-Cont.<br>Post-Cont: |             |             | 77<br>114   | 78<br>114   | 78<br>117   |
|                                         |               | LINE 337                                                                      | Pre-Cont.<br>Post-Cont: |             |             | 77<br>114   | 78<br>114   | 77<br>116   |
|                                         |               | MYSTIC 345A                                                                   | Pre-Cont.<br>Post-Cont: |             |             | 77<br>99    | 78<br>96    | 78<br>98    |
|                                         |               | MYSTIC SB104                                                                  | Pre-Cont.<br>Post-Cont: |             |             | 77<br>111   | 79<br>109   |             |
|                                         |               | MYSTIC SB105                                                                  | Pre-Cont.<br>Post-Cont: |             |             | 77<br>98    | 78<br>96    | 78<br>98    |
|                                         |               | TEWKS 37-39                                                                   | Pre-Cont.<br>Post-Cont: | 60<br>96    | 60<br>116   | 77<br>117   | 78<br>117   | 78<br>120   |
|                                         |               | TEWKS 37-39+151                                                               | Pre-Cont.<br>Post-Cont: | 60<br>96    | 60<br>117   | 77<br>117   | 78<br>118   | 78<br>120   |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 8 of 11)**

| <b>Boston Area Generation Dispatch</b>       |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b> |                  |             |             |             |             |
|----------------------------------------------|---------------|-------------------------------------------------------------------------------|------------------|-------------|-------------|-------------|-------------|
|                                              |               | Modeled NEPOOL Load+Losses (MW):                                              | 27,406           | 27,713      | 28,105      | 28,608      | 29,022      |
| Modeled NSTAR-North Load (MW):               |               | 4,055                                                                         | 4,099            | 4,207       | 4,291       | 4,366       |             |
| Modeled NSTAR-North Load (MVA):              |               | 4,274                                                                         | 4,320            | 4,434       | 4,523       | 4,602       |             |
| Boston Import Level (MW):                    |               | 3,591                                                                         | 3,675            | 3,819       | 3,941       | 4,042       |             |
| <b>Circuit Element</b>                       | <b>L.T.E.</b> | <b>Contingency</b>                                                            | <b>Condition</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>2007</b> |
| 115kV Cable 282-520 (Watertown-Brighton)     | 152           | 240-601+282-602 DCT                                                           | Pre-Cont.        | 47          | 49          | 56          |             |
|                                              |               | 282-602+433-507 DCT                                                           | Post-Cont:       | 95          | 100         | 96          |             |
| 115kV Cable 282-521 (Watertown-Brighton)     | 152           | 282-602+433-507 DCT                                                           | Pre-Cont:        | 47          |             | 56          | 60          |
|                                              |               |                                                                               | Post-Cont:       | 140         |             | 138         | 139         |
| CABLE 282-520                                |               | 282-602+433-507 DCT                                                           | Pre-Cont.        | 43          |             | 55          | 58          |
|                                              |               |                                                                               | Post-Cont:       | 132         |             | 130         | 131         |
| 115kV Cable 329-531 (No.Cambridge-Brighton)  | 292           | CABLE 329-530                                                                 | Pre-Cont.        | 75          |             | 55          | 52          |
|                                              |               |                                                                               | Post-Cont:       | 117         |             | 106         | 101         |
| KINGSTON 345A                                |               | KINGSTON 345A                                                                 | Pre-Cont.        |             |             | 74          | 76          |
|                                              |               |                                                                               | Post-Cont:       |             |             | 117         | 120         |
| 115kV Cable 385-511 (Kingston-King Network)  | 345           | CABLE 385-510                                                                 | Pre-Cont.        |             |             | 77          | 79          |
|                                              |               |                                                                               | Post-Cont:       |             |             | 97          | 99          |
| 115kV Cable 385-511 (Kingston Net-High St)   | 241           | CABLE 385-510                                                                 | Pre-Cont.        | 65          |             | 64          | 65          |
|                                              |               |                                                                               | Post-Cont:       | 108         |             | 106         | 108         |
| 115kV Cable 110-510 (Washington Tp-Baker St) | 159           | 110-522+240-510 DCT                                                           | Pre-Cont.        | 66          |             | 67          | 68          |
|                                              |               |                                                                               | Post-Cont:       | 97          |             | 98          | 101         |
| LINE 148-522XY-W                             |               | LINE 148-522XY-W                                                              | Pre-Cont.        | 44          |             |             |             |
|                                              |               |                                                                               | Post-Cont:       | 96          |             |             |             |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 9 of 11)**

| Boston Area Generation Dispatch                                                                                                                                                     |        | Thermal Results With Mystic Block 9 & New Boston OFF (% of L.T.E.)                                                                 |                                   |                                   |                                   |                                   |                                   |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------|
| Circuit Element                                                                                                                                                                     | L.T.E. | Contingency                                                                                                                        | Condition                         | 2004                              | 2005                              | 2006                              | 2007                              | 2008      |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1, Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2, MBTA, Fram, L-St, Potter, RESCO, GE-Lynn, (Mystic 4,5,6, New Boston, and Block 9 OFF) |        | Modeled NEPOOL Load+Losses (MW):<br>Modeled NSTAR-North Load (MW):<br>Modeled NSTAR-North Load (MVA):<br>Boston Import Level (MW): | 27,406<br>4,055<br>4,274<br>3,591 | 27,713<br>4,099<br>4,320<br>3,675 | 28,105<br>4,207<br>4,434<br>3,819 | 28,608<br>4,291<br>4,523<br>3,941 | 29,022<br>4,366<br>4,602<br>4,042 |           |
| 115kV Cable 110-511 (Washington Tp-Baker St)                                                                                                                                        | 159    | 110-522+240-510 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           | 45<br>125                         |                                   |                                   |                                   |           |
|                                                                                                                                                                                     |        | LINE 148-522XY-W                                                                                                                   | Pre-Cont.<br>Post-Cont:           | 45<br>97                          |                                   |                                   |                                   |           |
| 115kV Line 240-508 (Medway-Sherborn)                                                                                                                                                | 281    | 240-601+282-602 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           |                                   | 41<br>96                          | 43<br>100                         | 42<br>100                         |           |
| 115kV Line 433-507 (Framingham-Speen St)                                                                                                                                            | 282    | 282-602+282-507 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           | 56<br>102                         |                                   | 59<br>100                         | 58<br>101                         | 61<br>104 |
|                                                                                                                                                                                     |        | LINE 282-507                                                                                                                       | Pre-Cont.<br>Post-Cont:           | 55<br>99                          | 55<br>98                          | 59<br>100                         | 58<br>101                         | 61<br>104 |
| 115kV Baker Street Phase Shifter #1                                                                                                                                                 | 159    | 110-522+240-510 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           | 45<br>129                         |                                   |                                   |                                   |           |
|                                                                                                                                                                                     |        | LINE 148-522XY-W                                                                                                                   | Pre-Cont.<br>Post-Cont:           | 45<br>98                          |                                   |                                   |                                   |           |
| 115kV Baker Street Phase Shifter #2                                                                                                                                                 | 159    | 110-522+240-510 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           | 46<br>130                         |                                   |                                   |                                   |           |
|                                                                                                                                                                                     |        | LINE 148-522XY-W                                                                                                                   | Pre-Cont.<br>Post-Cont:           | 46<br>99                          |                                   |                                   |                                   |           |
| 115kV Line 447-508 (Walpole-Norwood)                                                                                                                                                | 205    | W. WALPOLE 345A                                                                                                                    | Pre-Cont.<br>Post-Cont:           |                                   |                                   | 62<br>98                          | 62<br>98                          | 62<br>100 |
| 115kV Line 447-508 (Canton-Norwood)                                                                                                                                                 | 205    | 240-601+282-602 DCT                                                                                                                | Pre-Cont.<br>Post-Cont:           |                                   |                                   | 79<br>98                          | 79<br>98                          | 80<br>117 |
|                                                                                                                                                                                     |        | W. WALPOLE 345A                                                                                                                    | Pre-Cont.<br>Post-Cont:           | 72<br>108                         |                                   | 79<br>108                         | 79<br>117                         | 80<br>120 |

**NOTE:** Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 10 of 11)**

| <b>Boston Area Generation Dispatch</b>                                                                                                                                                       |               | <b>Thermal Results With Mystic Block 9 &amp; New Boston OFF (% of L.T.E.)</b> |                  |             |             |             |             |             |     |        |     |        |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------|------------------|-------------|-------------|-------------|-------------|-------------|-----|--------|-----|--------|--|
|                                                                                                                                                                                              |               | Modeled NEPOOL Load+Losses (MW):                                              |                  | 27,406      |             | 27,713      |             | 28,105      |     | 28,608 |     | 29,022 |  |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1,<br>Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2,<br>MBTA, Fram, L-St, Potter, RESCO, GE-Lynn,<br>(Mystic 4,5,6, New Boston, and Block 9 OFF) |               | Modeled NSTAR-North Load (MW):                                                |                  | 4,055       |             | 4,099       |             | 4,207       |     | 4,291  |     | 4,366  |  |
| Modeled NSTAR-North Load (MVA):                                                                                                                                                              |               | 4,274                                                                         |                  | 4,320       |             | 4,434       |             | 4,523       |     | 4,602  |     |        |  |
| Boston Import Level (MW):                                                                                                                                                                    |               | 3,591                                                                         |                  | 3,675       |             | 3,819       |             | 3,941       |     | 4,042  |     |        |  |
| <b>Circuit Element</b>                                                                                                                                                                       | <b>L.T.E.</b> | <b>Contingency</b>                                                            | <b>Condition</b> | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b> |     |        |     |        |  |
| 115kV Line 447-508 (Canton-So.Randolph)                                                                                                                                                      | 293           | W. WALPOLE 345A                                                               | Pre-Cont.        |             |             |             |             |             | 71  | 71     | 71  | 71     |  |
|                                                                                                                                                                                              |               |                                                                               | Post-Cont:       |             |             |             |             |             | 97  | 98     | 98  | 100    |  |
| 115kV Line 447-509 (Canton-Norwood)                                                                                                                                                          | 227           | W. WALPOLE 345A                                                               | Pre-Cont.        | 63          |             |             |             |             | 70  | 70     | 70  | 71     |  |
|                                                                                                                                                                                              |               |                                                                               | Post-Cont:       | 97          |             |             |             |             | 104 | 105    | 105 | 107    |  |
| 115kV Line 447-509 (Holbrook-So.Randolph)                                                                                                                                                    | 293           | W. WALPOLE 345A                                                               | Pre-Cont.        |             |             |             |             |             | 69  | 70     | 70  | 70     |  |
|                                                                                                                                                                                              |               |                                                                               | Post-Cont:       |             |             |             |             |             | 96  | 97     | 97  | 99     |  |
| 115kV Line 447-508 (Holbrook-So.Randolph)                                                                                                                                                    | 293           | W. WALPOLE 345A                                                               | Pre-Cont.        | 71          |             |             |             |             | 76  | 77     | 77  | 78     |  |
|                                                                                                                                                                                              |               |                                                                               | Post-Cont:       | 99          |             |             |             |             | 105 | 105    | 105 | 108    |  |
| 115kV Line 447-509 (Holbrook-So.Randolph)                                                                                                                                                    | 293           | W. WALPOLE 345A                                                               | Pre-Cont.        |             |             |             |             |             | 69  | 69     | 70  | 70     |  |
|                                                                                                                                                                                              |               |                                                                               | Post-Cont:       | 97          |             |             |             |             | 97  | 98     | 98  | 100    |  |

Table D-1(c). Contingency Loading Violations – Block 9 & New Boston OFF (pg 11 of 11)

| Boston Area Generation Dispatch                                                                                                                                                     |                     | Voltage Results With Mystic Block 9 & New Boston OFF (p.u.) |            |      |        |      |        |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------|------------|------|--------|------|--------|------|------|
| Station Bus                                                                                                                                                                         | Contingency         | Condition                                                   | 2004       |      | 2005   |      | 2006   | 2007 | 2008 |
|                                                                                                                                                                                     |                     |                                                             | Pre-Cont:  | 0.99 | 1.00   | 0.99 |        |      |      |
|                                                                                                                                                                                     |                     |                                                             | Post-Cont: | 0.94 | 0.94   | 0.93 |        |      |      |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1, Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2, MBTA, Fram, L-St, Potter, RESCo, GE-Lynn, (Mystic 4,5,6, New Boston, and Block 9 OFF) | LINE 533-508        | Modeled NEPOOL Load+Losses (MW):                            | 28,105     |      | 28,608 |      | 29,022 |      |      |
| Burlington 115kV                                                                                                                                                                    | LINE 533-508        | Modeled NSTAR-North Load (MW):                              | 4,207      |      | 4,291  |      | 4,366  |      |      |
| Hartwell Avenue 115kV                                                                                                                                                               | LINE 533-508        | Modeled NSTAR-North Load (MVA):                             | 4,434      |      | 4,523  |      | 4,602  |      |      |
| Chelsea 115kV                                                                                                                                                                       | LINE 488-518        | Boston Import Level (MW):                                   | 3,819      |      | 3,941  |      | 4,042  |      |      |
| Sherborn 115kV                                                                                                                                                                      | 240-601+282-602 DCT | Pre-Cont:                                                   | 0.98       | 0.98 | 0.98   |      |        |      |      |
| West Framingham 115kV                                                                                                                                                               | LINE 240-508        | Post-Cont:                                                  | 0.89       | 0.88 | 0.88   |      |        |      |      |
| Speen Street 115kV                                                                                                                                                                  | 240-601+282-602 DCT | Pre-Cont:                                                   | 1.00       |      |        |      |        |      |      |
| Maynard 115kV                                                                                                                                                                       | 282-602+433-507 DCT | Post-Cont:                                                  | 0.94       |      |        |      |        |      |      |
| Northborough Road 115kV                                                                                                                                                             | LINE 240-508        | Pre-Cont:                                                   | 0.96       | 0.97 | 0.97   |      | 0.95   | 0.95 |      |
|                                                                                                                                                                                     | LINE 455-507        | Post-Cont:                                                  | 0.91       | 0.90 | 0.89   |      | 0.88   | 0.88 |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 0.98       | 0.99 | 0.99   |      | 0.98   | 0.97 |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.83       | 0.83 | 0.81   |      | 0.80   | 0.78 |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 1.01       |      |        |      |        |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.95       |      |        |      |        |      |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 1.01       |      |        |      | 1.02   |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.91       |      |        |      | 0.94   |      |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 1.01       |      |        |      | 1.01   |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.95       |      |        |      | 0.95   |      |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 1.01       |      |        |      | 1.02   |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.92       |      |        |      | 0.95   |      |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 1.01       |      |        |      | 1.01   |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.92       |      |        |      | 0.95   |      |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 1.01       |      |        |      | 1.02   |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.92       |      |        |      | 0.95   |      |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 0.96       | 0.97 | 0.97   |      | 0.95   |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.91       | 0.90 | 0.89   |      | 0.88   |      |      |
|                                                                                                                                                                                     |                     | Pre-Cont:                                                   | 0.96       | 0.97 | 0.97   |      | 0.95   |      |      |
|                                                                                                                                                                                     |                     | Post-Cont:                                                  | 0.84       | 0.84 | 0.82   |      | 0.81   |      |      |

**Table D-1(d). Contingency Voltage Violations – Block 9 & New Boston OFF (pg 1 of 1)**

**APPENDIX D-2. TABULAR RESULTS –**  
**BLOCK 9 OFF, NEW BOSTON ON.**

| <b>Boston Area Generation Dispatch</b>           |                                  | <b>Thermal Results With Block 9 OFF &amp; New Boston ON (% Normal Rating)</b> |      |      |      |      |      |
|--------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------|------|------|------|------|------|
| Circuit Element                                  | Normal (Continuous) Rating (MVA) | Condition                                                                     | 2004 | 2005 | 2006 | 2007 | 2008 |
| Mystic 345A Autotransformer                      | 360                              | All Lines In                                                                  |      |      |      | 96   | 95   |
| 115kV Line 240-508 (Sherborn - W. Framingham)    | 227                              | All Lines In                                                                  | 96   | 95   | 97   | 99   | 100  |
| 115kV Line 240-508 (Sherborn - Framingham)       | 230                              | All Lines In                                                                  |      | 95   | 97   | 98   | 100  |
| 115kV Cable 292-523 (Baker Street - Newton 10AB) | 120                              | All Lines In                                                                  |      |      |      | 95   |      |
| 115kV Line 447-509 (Holbrook - So. Randolph)     | 227                              | All Lines In                                                                  |      |      |      | 96   |      |

Table D-2 (a). “All-Lines-In” Loading Violations- Block 9 OFF & New Boston ON (pg 1 of 1)

| <b>Boston Area Generation Dispatch</b> |                        | <b>Voltage Results With Mystic Block 9 &amp; New Boston ON (% Normal Rating)</b> |             |             |             |             |                                      |
|----------------------------------------|------------------------|----------------------------------------------------------------------------------|-------------|-------------|-------------|-------------|--------------------------------------|
| <b>Station Bus</b>                     | <b>Nominal Voltage</b> | <b>Condition</b>                                                                 | <b>2004</b> | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b>                          |
| All NSTAR-North Transmission Stations  | 115kV and 345kV        | All Lines In                                                                     |             |             |             |             | No Voltage Violations For Any Years. |

Table D-2(b). "All-Lines-In" Voltage Violations- Block 9 OFF & New Boston ON (pg 1 of 1)

| <b>Boston Area Generation Dispatch</b>                                                                                                                                                       |               | <b>Thermal Results With Block 9 OFF, New Boston ON (% of LTE Rating)</b> |                                                                               |             |                                  |                                  |                      |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------|----------------------------------|----------------------------------|----------------------|-------------|
| <b>Circuit Element</b>                                                                                                                                                                       | <b>L.T.E.</b> | <b>Contingency</b>                                                       | <b>Condition</b>                                                              | <b>2004</b> | <b>2005</b>                      | <b>2006</b>                      | <b>2007</b>          | <b>2008</b> |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1, New Boston Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2, MBTA, Framingham Jets, L-St, Potter, RESCo, GE-Lynn, (Mystic 4,5,6 and Block 9 OFF) |               |                                                                          | Modeled NEPOOL Load+Losses (MW):                                              | 27,394      | 27,702                           | 28,081                           | 28,597               | 29,008      |
|                                                                                                                                                                                              |               |                                                                          | Modeled NSTAR-North Load (MW):                                                | 4,055       | 4,099                            | 4,207                            | 4,291                | 4,366       |
|                                                                                                                                                                                              |               |                                                                          | Modeled NSTAR-North Load (MVA):                                               | 4,274       | 4,320                            | 4,434                            | 4,523                | 4,602       |
|                                                                                                                                                                                              |               |                                                                          | Boston Import Level (MW):                                                     | 3,234       | 3,317                            | 3,477                            | 3,582                | 3,682       |
| 345kV Cable 372 (Mystic-Kingston Street)                                                                                                                                                     | 844           | MYSTIC SB108                                                             | Pre-Cont:<br>Post-Cont:                                                       | 48<br>96    | 49<br>96                         | 51<br>101                        | 51<br>102            |             |
| 345kV Cable 324 (Mystic-Kingston Street)                                                                                                                                                     | 844           | CABLE 372                                                                | Pre-Cont:<br>Post-Cont:                                                       | 48<br>95    | 49<br>96                         | 51<br>101                        | 51<br>102            |             |
|                                                                                                                                                                                              |               | MYSTIC SB102                                                             | Pre-Cont:<br>Post-Cont:                                                       |             | 49<br>96                         | 51<br>101                        | 51<br>101            |             |
| Kingston St 345B Autotransformer                                                                                                                                                             | 540           | 240-601+282-602 DCT                                                      | Pre-Cont:<br>Post-Cont:                                                       |             |                                  | 84<br>96                         | 84<br>97             |             |
|                                                                                                                                                                                              |               | KINGSTON 345A                                                            | Pre-Cont:<br>Post-Cont:                                                       | 79<br>101   | 77<br>99                         | 79<br>102                        | 84<br>107            | 108         |
|                                                                                                                                                                                              |               | MYSTIC 345A                                                              | Pre-Cont:<br>Post-Cont:                                                       |             |                                  | 84<br>98                         | 84<br>99             |             |
|                                                                                                                                                                                              |               | MYSTIC SB105                                                             | Pre-Cont:<br>Post-Cont:                                                       |             |                                  | 84<br>98                         | 84<br>99             |             |
| 115kV Line 320-508 (Lexington-Trapelo Rd)                                                                                                                                                    | 140           | 240-601+282-602 DCT<br>282-602+433-507 DCT                               | Pre-Cont:<br>Post-Cont:<br>Pre-Cont:<br>Post-Cont:<br>Pre-Cont:<br>Post-Cont: |             | 62<br>61<br>95<br>95<br>62<br>96 | 63<br>63<br>96<br>99<br>63<br>96 |                      |             |
|                                                                                                                                                                                              |               | LINE 320-507                                                             | Pre-Cont:<br>Post-Cont:<br>Pre-Cont:<br>Post-Cont:                            |             |                                  |                                  | 62<br>62<br>98<br>98 |             |
| 115kV Line 320-507 (Lexington-Trapelo Rd)                                                                                                                                                    | 140           | 240-601+282-602 DCT<br>282-602+433-507 DCT                               | Pre-Cont:<br>Post-Cont:<br>Pre-Cont:<br>Post-Cont:                            |             |                                  |                                  | 62<br>62<br>96<br>98 | 99          |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-2 (c). Contingency Loading Violations - Block 9 OFF, New Boston ON (pg 1 of 4)**

| Boston Area Generation Dispatch          |        | Thermal Results With Block 9 OFF, New Boston ON (% of LTE Rating) |                         |           |           |           |           |           |
|------------------------------------------|--------|-------------------------------------------------------------------|-------------------------|-----------|-----------|-----------|-----------|-----------|
| Circuit Element                          | L.T.E. | Contingency                                                       | Condition               | 2004      | 2005      | 2006      | 2007      | 2008      |
| 115kV Cable 282-520 (Waltham-Watertown)  | 152    | 282-602+433-507 DCT                                               | Pre-Cont:<br>Post-Cont: | 42<br>115 | 47<br>109 | 62<br>112 | 49<br>111 | 60<br>116 |
| 115kV Cable 282-521 (Waltham-Watertown)  | 152    | 282-602+433-507 DCT                                               | Pre-Cont:<br>Post-Cont: | 41<br>108 | 47<br>102 | 62<br>105 | 50<br>103 | 60<br>108 |
| 115kV Cable 282-520 (Watertown-Brighton) | 152    | 240-601+282-602 DCT                                               | Pre-Cont:<br>Post-Cont: | 57<br>117 | 57<br>109 | 63<br>111 | 52<br>111 | 62<br>114 |
|                                          |        | 282-602+433-507 DCT                                               | Pre-Cont:<br>Post-Cont: | 57<br>154 | 57<br>147 | 63<br>149 | 52<br>150 | 62<br>154 |
| LEXINGTN345A                             |        | Pre-Cont:<br>Post-Cont:                                           | 57<br>108               | 57<br>103 | 63<br>100 | 52<br>102 | 61<br>104 |           |
| LINE 319                                 |        | Pre-Cont:<br>Post-Cont:                                           | 57<br>108               | 57<br>103 | 63<br>100 | 52<br>102 | 61<br>104 |           |
| WOBURN SB103                             |        | Pre-Cont:<br>Post-Cont:                                           | 57<br>107               | 57<br>102 | 63<br>100 | 52<br>101 | 61<br>104 |           |
| 115kV Cable 282-521 (Watertown-Brighton) | 152    | 240-601+282-602 DCT                                               | Pre-Cont:<br>Post-Cont: | 50<br>109 | 51<br>102 | 58<br>103 | 46<br>103 | 56<br>106 |
|                                          |        | 282-602+433-507 DCT                                               | Pre-Cont:<br>Post-Cont: | 50<br>145 | 51<br>140 | 58<br>141 | 46<br>141 | 56<br>145 |
| CABLE282-520                             |        | Pre-Cont:<br>Post-Cont:                                           | 50<br>107               | 51<br>106 | 58<br>117 | 46<br>101 | 56<br>115 |           |
| LEXINGTN345A                             |        | Pre-Cont:<br>Post-Cont:                                           | 49<br>100               | 51<br>95  |           |           | 56<br>96  |           |
| LINE 319                                 |        | Pre-Cont:<br>Post-Cont:                                           | 49<br>100               | 51<br>95  |           |           | 56<br>96  |           |
| WOBURN SB103                             |        | Pre-Cont:<br>Post-Cont:                                           | 49<br>99                |           |           |           | 56<br>96  |           |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-2 (c). Contingency Loading Violations - Block 9 OFF, New Boston ON (pg 2 of 4)**

| <b>Boston Area Generation Dispatch</b>                                                                                                                                                       |     | <b>Thermal Results With Block 9 OFF, New Boston ON (% of LTE Rating)</b>                                                              |                                   |                                   |                                   |                                   |                                   |             |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------|-------------|
|                                                                                                                                                                                              |     | <b>L.T.E.</b>                                                                                                                         | <b>Contingency</b>                | <b>Condition</b>                  | <b>2004</b>                       | <b>2005</b>                       | <b>2006</b>                       | <b>2007</b> | <b>2008</b> |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1, New Boston Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2, MBTA, Framingham Jets, L-St, Potter, RESCo, GE-Lynn, (Mystic 4,5,6 and Block 9 OFF) |     | Modelled NEPOOL Load+Losses (MW):<br>Modelled NSTAR-North Load (MW):<br>Modelled NSTAR-North Load (MVA):<br>Boston Import Level (MW): | 27,406<br>4,055<br>4,274<br>3,591 | 27,713<br>4,099<br>4,320<br>3,675 | 28,105<br>4,207<br>4,434<br>3,819 | 28,608<br>4,291<br>4,523<br>3,941 | 29,022<br>4,366<br>4,602<br>4,042 |             |             |
| 115kV Cable 329-531 (Brighton-No.Cambridge)                                                                                                                                                  | 292 | CABLE 329-530                                                                                                                         | Pre-Cont:<br>Post-Cont:           | 66<br>103                         | 65<br>104                         | 69<br>109                         | 69<br>106                         |             |             |
| 115kV Cable 110-510 (Brighton-Washington)                                                                                                                                                    | 152 | 110-522+240-510 DCT                                                                                                                   | Pre-Cont:<br>Post-Cont:           |                                   | 47<br>103                         | 44<br>96                          |                                   |             |             |
| 115kV Cable 110-511 (Brighton-Washington)                                                                                                                                                    | 152 | 110-522+240-510 DCT                                                                                                                   | Pre-Cont:<br>Post-Cont:           | 46<br>63                          | 51<br>60                          | 49<br>50                          |                                   |             |             |
| 115kV Cable 110-510 (Washington-Baker St)                                                                                                                                                    | 159 | 110-522+240-510 DCT                                                                                                                   | Pre-Cont:<br>Post-Cont:           | 124                               | 128                               | 127                               | 128                               |             |             |
|                                                                                                                                                                                              |     | LINE 148-522XY-E                                                                                                                      | Pre-Cont:<br>Post-Cont:           | 63<br>103                         | 60<br>101                         | 56<br>99                          | 56<br>97                          |             |             |
|                                                                                                                                                                                              |     | LINE 148-522XY-W                                                                                                                      | Pre-Cont:<br>Post-Cont:           | 63<br>108                         | 61<br>101                         | 56<br>99                          | 56<br>99                          |             |             |
| 115kV Cable 110-511 (Washington-Baker St)                                                                                                                                                    | 159 | 110-522+240-510 DCT                                                                                                                   | Pre-Cont:<br>Post-Cont:           | 125                               | 129                               | 128                               | 129                               |             |             |
|                                                                                                                                                                                              |     | LINE 148-522XY-E                                                                                                                      | Pre-Cont:<br>Post-Cont:           | 64<br>104                         | 61<br>101                         | 57<br>100                         | 53<br>98                          |             |             |
|                                                                                                                                                                                              |     | LINE 148-522XY-W                                                                                                                      | Pre-Cont:<br>Post-Cont:           | 64<br>109                         | 61<br>102                         | 51<br>95                          | 57<br>100                         |             |             |
| 115kV Line 433-507 (Framingham-Speen St)                                                                                                                                                     | 282 | 282-602+282-507 DCT                                                                                                                   | Pre-Cont:<br>Post-Cont:           | 47<br>101                         | 47<br>98                          | 51<br>99                          | 50<br>101                         | 52<br>103   |             |
|                                                                                                                                                                                              |     | LINE 282-507                                                                                                                          | Pre-Cont:<br>Post-Cont:           | 47<br>98                          | 47<br>98                          | 51<br>99                          | 50<br>101                         | 52<br>103   |             |
| 115kV Baker St Phase Angle Regulator #1                                                                                                                                                      | 159 | 110-522+240-510 DCT                                                                                                                   | Pre-Cont:<br>Post-Cont:           | 65<br>129                         | 61<br>137                         | 52<br>137                         | 57<br>134                         |             |             |
|                                                                                                                                                                                              |     | LINE 148-522XY-E                                                                                                                      | Pre-Cont:<br>Post-Cont:           | 65<br>106                         | 61<br>105                         | 52<br>99                          | 57<br>102                         | 54<br>101   |             |
|                                                                                                                                                                                              |     | LINE 148-522XY-W                                                                                                                      | Pre-Cont:<br>Post-Cont:           | 65<br>112                         | 61<br>105                         | 52<br>99                          | 57<br>102                         |             |             |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-2(c). Contingency Loading Violations - Block 9 OFF, New Boston ON (pg 3 of 4)**

| <b>Boston Area Generation Dispatch</b>                                                                                                                                                       |               | <b>Thermal Results With Block 9 OFF, New Boston ON (% of LTE Rating)</b>                                                           |                                   |                                   |                                   |                                   |                                   |             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------|
| <b>Circuit Element</b>                                                                                                                                                                       | <b>L.T.E.</b> | <b>Contingency</b>                                                                                                                 | <b>Condition</b>                  | <b>2004</b>                       | <b>2005</b>                       | <b>2006</b>                       | <b>2007</b>                       | <b>2008</b> |
| Mystic Block 8, Mystic 7, Kendall 1-4 & Jet 1, New Boston Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2, MBTA, Framingham Jets, L-St, Potter, RESCo, GE-Lynn, (Mystic 4,5,6 and Block 9 OFF) |               | Modeled NEPOOL Load+Losses (MW):<br>Modeled NSTAR-North Load (MW):<br>Modeled NSTAR-North Load (MVA):<br>Boston Import Level (MW): | 27,406<br>4,099<br>4,274<br>3,591 | 27,713<br>4,207<br>4,320<br>3,675 | 28,105<br>4,291<br>4,434<br>3,819 | 28,608<br>4,366<br>4,523<br>3,941 | 29,022<br>4,366<br>4,602<br>4,042 |             |
| 115kV Baker St Phase Angle Regulator #2                                                                                                                                                      | 159           | 110-522+240-510 DCT                                                                                                                | Pre-Cont:<br>Post-Cont:           | 66<br>130                         | 62<br>137                         | 52<br>137                         | 57<br>135                         |             |
|                                                                                                                                                                                              |               | LINE 148-522XY-E                                                                                                                   | Pre-Cont:<br>Post-Cont:           | 66<br>107                         | 62<br>106                         | 52<br>99                          | 57<br>103                         | 55<br>102   |
|                                                                                                                                                                                              |               | LINE 148-522XY-W                                                                                                                   | Pre-Cont:<br>Post-Cont:           | 66<br>113                         | 62<br>106                         | 52<br>100                         | 57<br>103                         |             |
| 115kV Line 447-508 (Canton-Norwood)                                                                                                                                                          | 205           | W.WALPOLE 345A                                                                                                                     | Pre-Cont:<br>Post-Cont:           | 68<br>103                         | 72<br>107                         | 76<br>112                         | 76<br>112                         | 77<br>114   |
| 115kV Line 447-509 (Canton-Norwood)                                                                                                                                                          | 227           | W.WALPOLE 345A                                                                                                                     | Pre-Cont:<br>Post-Cont:           |                                   | 64<br>95                          | 67<br>100                         | 67<br>100                         | 68<br>102   |
| 115kV Line 447-509 (Holbrook-So.Randolph)                                                                                                                                                    | 293           | W.WALPOLE 345A                                                                                                                     | Pre-Cont:<br>Post-Cont:           | 69<br>95                          | 71<br>97                          | 74<br>101                         | 74<br>102                         | 75<br>103   |
| 115kV Line 447-508 (Holbrook-So.Randolph)                                                                                                                                                    | 293           | W.WALPOLE 345A                                                                                                                     | Pre-Cont:<br>Post-Cont:           |                                   |                                   |                                   | 67<br>96                          |             |

NOTE: Shaded Areas Indicate Most Severe Contingency Violations by Year For Each Circuit Element.

**Table D-2(c). Contingency Loading Violations - Block 9 OFF, New Boston ON (pg 4 of 4)**

| <b>Boston Area Generation Dispatch</b>                                                                                                                                                      |                     | <b>Voltage Results With Block 9 Off, New Boston ON (p.u.)</b> |      |        |        |        |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------|------|--------|--------|--------|------|
|                                                                                                                                                                                             |                     | Modeled NEPOOL Load+Losses (MW):                              |      | 28,105 | 28,608 | 29,022 |      |
| Mystic 7 & Block 8, Kendall 1-4 & Jet 1, New Boston<br>Edgar 1-3, Salem 1-3, Canal 1&2, ANP-Bell 1&2,<br>MBTA, Fram, L-St, Potter, RESCo, GE-Lynn,<br><b>(Mystic 4,5,6 and Block 9 OFF)</b> |                     | Modeled NSTAR-North Load (MW):                                |      | 4,207  | 4,291  | 4,366  |      |
|                                                                                                                                                                                             |                     | Modeled NSTAR-North Load (MVA):                               |      | 4,434  | 4,523  | 4,602  |      |
|                                                                                                                                                                                             |                     | Boston Import Level (MW):                                     |      | 3,819  | 3,941  | 4,042  |      |
| Circuit Element                                                                                                                                                                             | Contingency         | Condition                                                     | 2004 | 2005   | 2006   | 2007   | 2008 |
| 70804,BRLNGTN ,115                                                                                                                                                                          | LINE 533-508        | Pre-Cont:                                                     | 1.00 | 1.00   | 1.00   | 0.99   |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.94 | 0.94   | 0.93   | 0.93   |      |
| 70805,LEXHRTWL,115                                                                                                                                                                          | LINE 533-508        | Pre-Cont:                                                     | 1.01 | 1.01   | 1.01   | 1.00   |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.93 | 0.93   | 0.93   | 0.92   |      |
| 70819,CHSEA MA,115                                                                                                                                                                          | LINE 488-518        | Pre-Cont:                                                     | 0.98 | 0.98   | 0.98   |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.89 | 0.89   | 0.88   |        |      |
| 70866,MEDWAY ,115                                                                                                                                                                           | LINE 240-508        | Pre-Cont:                                                     |      |        |        |        | 0.99 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    |      |        |        |        | 0.94 |
| 70867,MEDJ3TAP,115                                                                                                                                                                          | LINE 240-508        | Pre-Cont:                                                     |      |        |        |        | 0.99 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    |      |        |        |        | 0.94 |
| 70868,SHERBORN,115                                                                                                                                                                          | LINE 240-508        | Pre-Cont:                                                     | 1.01 | 1.02   | 1.02   | 1.01   | 1.01 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.92 | 0.92   | 0.91   | 0.90   | 0.89 |
| 70869,W FRMNGH,115                                                                                                                                                                          | LINE 240-508        | Pre-Cont:                                                     | 0.98 | 0.99   | 0.99   | 0.98   | 0.98 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.90 | 0.91   | 0.90   | 0.89   | 0.88 |
|                                                                                                                                                                                             | LINE 455-507        | Pre-Cont:                                                     | 0.98 | 0.99   | 0.99   | 0.98   | 0.98 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.85 | 0.83   | 0.82   | 0.80   | 0.78 |
| 70871,SPEEN ST,115                                                                                                                                                                          | 282-602+433-507 DCT | Pre-Cont:                                                     | 1.01 |        |        |        | 1.02 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.93 |        |        |        | 0.95 |
| 70872,SUDBURY ,115                                                                                                                                                                          | 282-602+433-507 DCT | Pre-Cont:                                                     | 1.02 |        |        |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.95 |        |        |        |      |
| 70873,MAYNRD A,115                                                                                                                                                                          | 282-602+433-507 DCT | Pre-Cont:                                                     | 1.01 |        |        |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.94 |        |        |        |      |
| 70874,MAYNRD B,115                                                                                                                                                                          | 282-602+433-507 DCT | Pre-Cont:                                                     | 1.01 |        |        |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.94 |        |        |        |      |
| 70888,BAKER ST,115                                                                                                                                                                          | 110-522+240-510 DCT | Pre-Cont:                                                     |      |        | 1.05   |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    |      |        | 1.11   |        |      |
| 70889,NWT110AB,115                                                                                                                                                                          | 110-522+240-510 DCT | Pre-Cont:                                                     |      |        | 1.05   |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    |      |        | 1.11   |        |      |
| 70890,NWT 110C,115                                                                                                                                                                          | 110-522+240-510 DCT | Pre-Cont:                                                     |      |        | 1.05   |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    |      |        | 1.11   |        |      |
| 70891,HYDE PKA,115                                                                                                                                                                          | 110-522+240-510 DCT | Pre-Cont:                                                     |      |        | 1.05   |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    |      |        | 1.11   |        |      |
| 70892,HYDE PKB,115                                                                                                                                                                          | 110-522+240-510 DCT | Pre-Cont:                                                     |      |        | 1.05   |        |      |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    |      |        | 1.11   |        |      |
| 72265,NBORO RD,115                                                                                                                                                                          | LINE 240-508        | Pre-Cont:                                                     | 0.96 | 0.98   | 0.97   | 0.96   | 0.96 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.90 | 0.91   | 0.90   | 0.89   | 0.88 |
|                                                                                                                                                                                             | LINE 455-507        | Pre-Cont:                                                     | 0.96 | 0.98   | 0.97   | 0.96   | 0.96 |
|                                                                                                                                                                                             |                     | Post-Cont:                                                    | 0.86 | 0.85   | 0.83   | 0.81   | 0.79 |

**Table D-2(d). Contingency Voltage Violations – Block 9 OFF, New Boston ON (pg 1 of 1)**

**APPENDIX E-1. ALL-LINES-IN**  
**LOADFLOW DIAGRAMS – BLOCK 9 &**  
**NEW BOSTON OFF**



**APPENDIX E-2. ALL-LINES-IN**  
**LOADFLOW DIAGRAMS – BLOCK 9 OFF,**  
**NEW BOSTON ON.**



## **APPENDIX F-1. CONTINGENCY LOADFLOW DIAGRAMS – BLOCK 9 & NEW BOSTON OFF.**

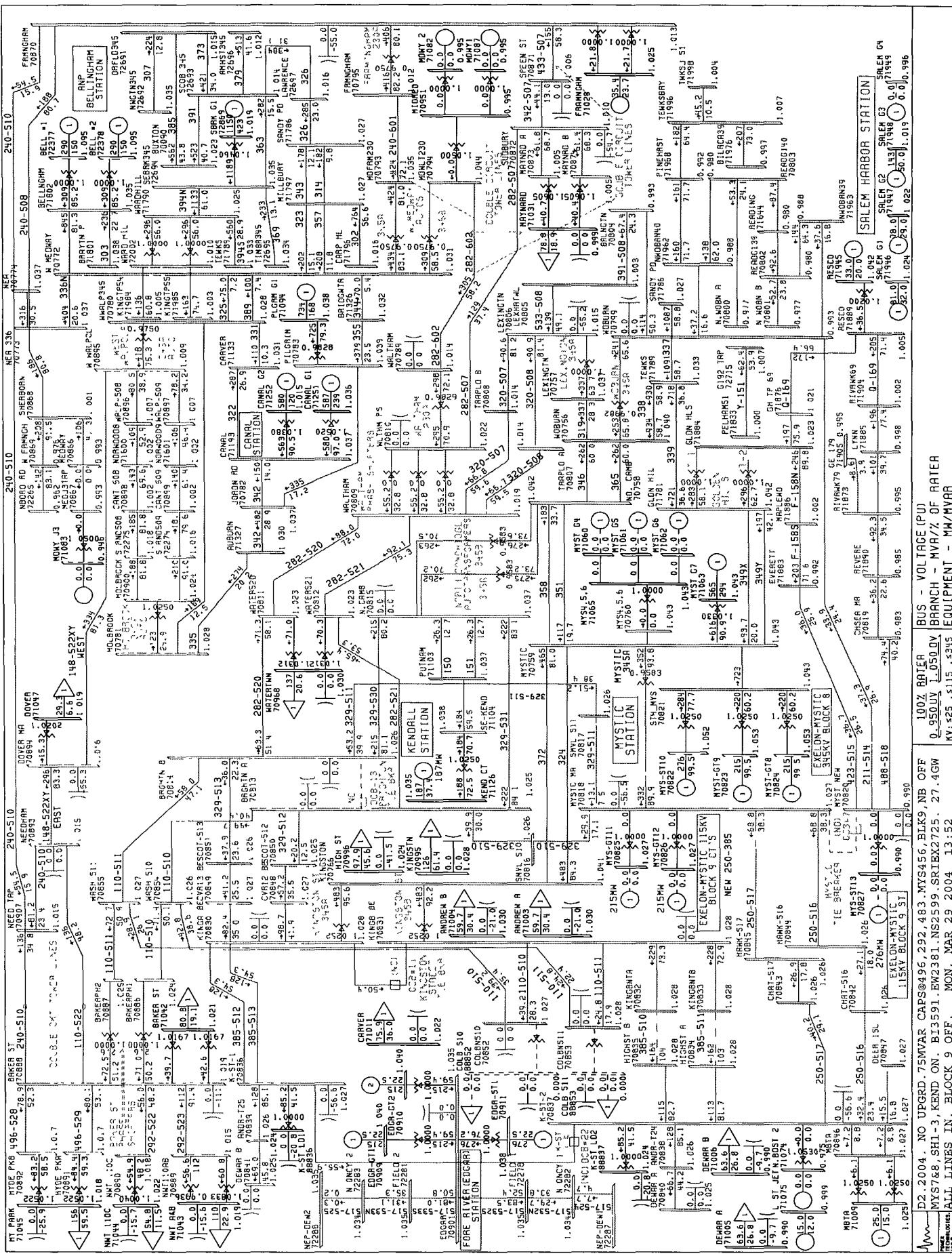
| Figure                                                                                                                                                                                                                                                                                                                                                                                                       | Contingency                                                                                                                                                                                                                                                                                                                                                                                                            | Overloaded Element (s)                                                                                                                         | Voltage Violations                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F-1A                                                                                                                                                                                                                                                                                                                                                                                                         | Mystic-Kingston Street<br>345kV Cable 372                                                                                                                                                                                                                                                                                                                                                                              | Mystic-Kingston Street<br>Parallel 345kV Cable 324                                                                                             | None                                                                                                                                                                                           |
| F-1B                                                                                                                                                                                                                                                                                                                                                                                                         | Kingston St 345A<br>Autotransformer                                                                                                                                                                                                                                                                                                                                                                                    | Kingston St 345B Autotransformer<br>Mystic 345A Autotransformer                                                                                | None                                                                                                                                                                                           |
| F-1C                                                                                                                                                                                                                                                                                                                                                                                                         | Lines 282-602+433-507<br>Double-Circuit Tower<br><br>(This Contingency Will Be<br>Eliminated In 2004 By Moving<br>the Lines to Separate Towers.)                                                                                                                                                                                                                                                                       | 115kV Cables 282-520 & 282-520<br>(Brighton-Watertown)<br><br>282-520 (Watertown-Waltham)<br><br>320-507 & 320-508<br>(Lexington-Trapelo Road) | Loss of 433-507 Places Speen Street,<br>Maynard, Sudbury on a Radial Feed<br>From Waltham.<br><br>Low Voltages (0.90pu-0.91pu)<br>Experienced In These Areas.                                  |
| F-1D                                                                                                                                                                                                                                                                                                                                                                                                         | 115kV Cable 282-520<br>(Brighton-Watertown-Waltham)                                                                                                                                                                                                                                                                                                                                                                    | Parallel 115kV Cable 282-521<br>(Brighton-Watertown-Waltham)                                                                                   | None                                                                                                                                                                                           |
| F-1E                                                                                                                                                                                                                                                                                                                                                                                                         | Tewksbury Stuck Breaker<br>37-39 + Loss of Y-151                                                                                                                                                                                                                                                                                                                                                                       | 115kV Cables 282-520 and 282-521<br>(Watertown-Waltham)                                                                                        | None                                                                                                                                                                                           |
| F-1F                                                                                                                                                                                                                                                                                                                                                                                                         | 115kV Cable 329-530<br>(North Cambridge-Brighton)                                                                                                                                                                                                                                                                                                                                                                      | Parallel 115kV Cable 329-531<br>(North Cambridge-Brighton)                                                                                     | None                                                                                                                                                                                           |
| F-1G                                                                                                                                                                                                                                                                                                                                                                                                         | 115kV Cable 385-510<br>(Kingston St – Kingston<br>Network – High St - K-Street)                                                                                                                                                                                                                                                                                                                                        | 115kV Cable 385-511<br>(Kingston Street – Kingston Network<br>Section)                                                                         | None                                                                                                                                                                                           |
| F-1H                                                                                                                                                                                                                                                                                                                                                                                                         | Lines 110-522+240-510<br>Double-Circuit Tower                                                                                                                                                                                                                                                                                                                                                                          | 115kV Baker St Phase Shifters 1 & 2<br><br>115kV Cables 110-510 & 110-511<br>(Washington Tap – Baker Street)                                   | None                                                                                                                                                                                           |
| This DCT contingency places Hyde Park, Baker Street, and Newton on a radial feed through the two Baker Street Phase Shifters and the 110-510 & 110-511 Cables (Washington Tap-Baker Street) That Supply Them. Hence, There Is No Way To Eliminate This Overload Through Phase Shifter Adjustment. The 345kV reinforcements, however, will eliminate all of the violations that occur during this DCT outage. |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                |                                                                                                                                                                                                |
| F-1I                                                                                                                                                                                                                                                                                                                                                                                                         | Lines 282-602+282-507<br>Double-Circuit Tower                                                                                                                                                                                                                                                                                                                                                                          | 115kV Line 433-507<br>(Speen Street - Framingham)                                                                                              | Low Voltages (~0.98pu) Experienced<br>In The Speen Street, Sudbury, and<br>Maynard areas.                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                              | Loss of 282-507 (Sudbury – Waltham) Places Speen Street, Sudbury, and Maynard on a Radial Feed From Framingham. This is the reverse situation of the 282-602+433-507 DCT (Figure 1C), wherein the stations are placed on a radial feed from the opposite end (Waltham). Voltage profiles are about .05pu higher in the area, though.                                                                                   |                                                                                                                                                |                                                                                                                                                                                                |
| F-1J                                                                                                                                                                                                                                                                                                                                                                                                         | West Walpole 345A<br>Autotransformer                                                                                                                                                                                                                                                                                                                                                                                   | 115kV Line 447-509<br>(Canton – Norwood)                                                                                                       | 115kV voltages along Lines 447-508 &<br>447-509 drop from 1.02 at Holbrook to<br>0.97 at West Walpole. Dover at 0.99pu;<br>Sherborn at 0.99; W. Framingham at<br>0.98; Northboro Road at 0.95. |
|                                                                                                                                                                                                                                                                                                                                                                                                              | Loss of the West Walpole Autotransformer places Lines 447-508 & 447-509 on a radial feed from the Holbrook Autotransformer. The Holbrook Auto is loaded to only 43% of its LTE rating, however. Lines closest to Holbrook carry the heaviest load because they have to supply the five 115kV step-down stations between Holbrook and West Walpole. Load drops off with each line section that gets closer to Holbrook. |                                                                                                                                                |                                                                                                                                                                                                |

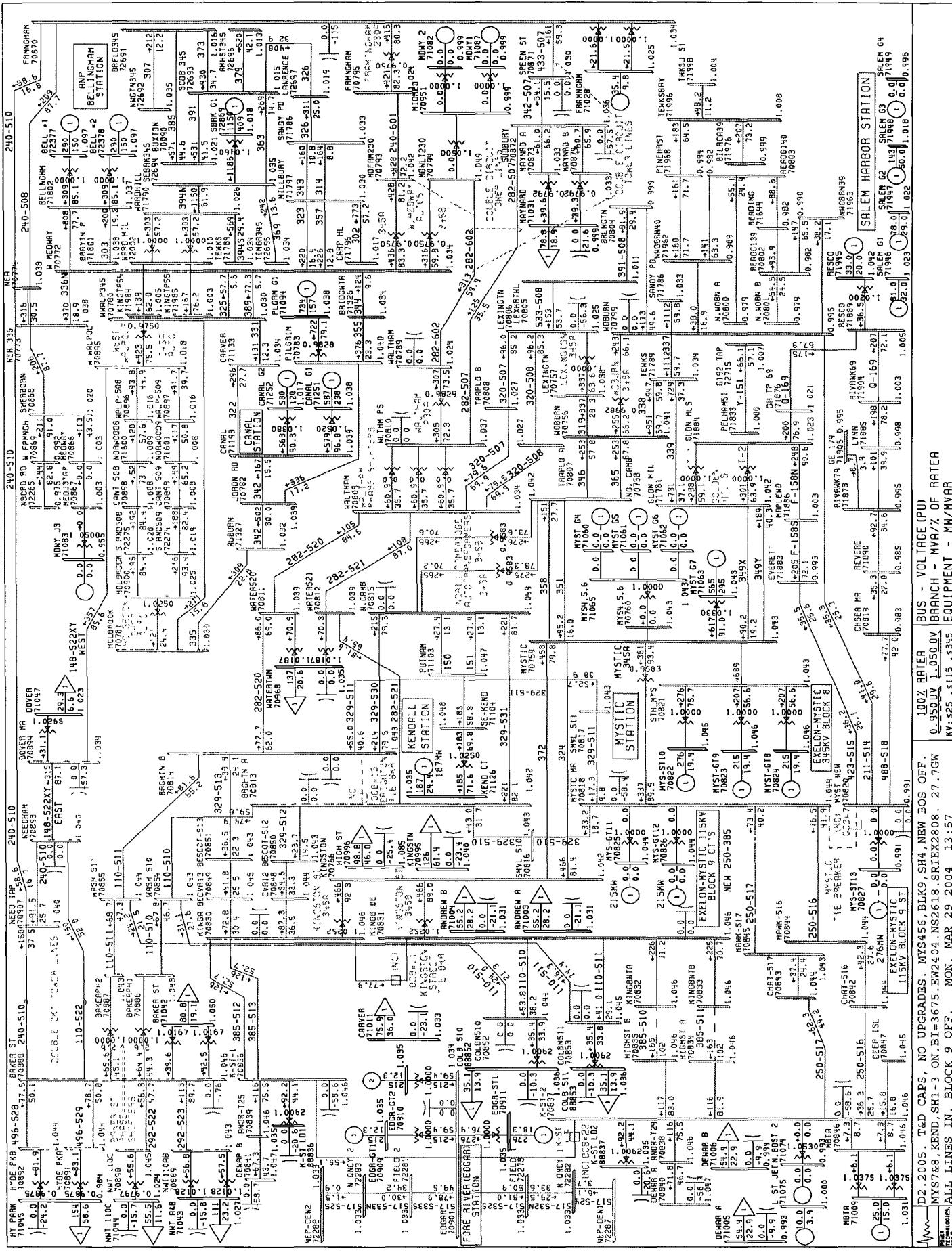


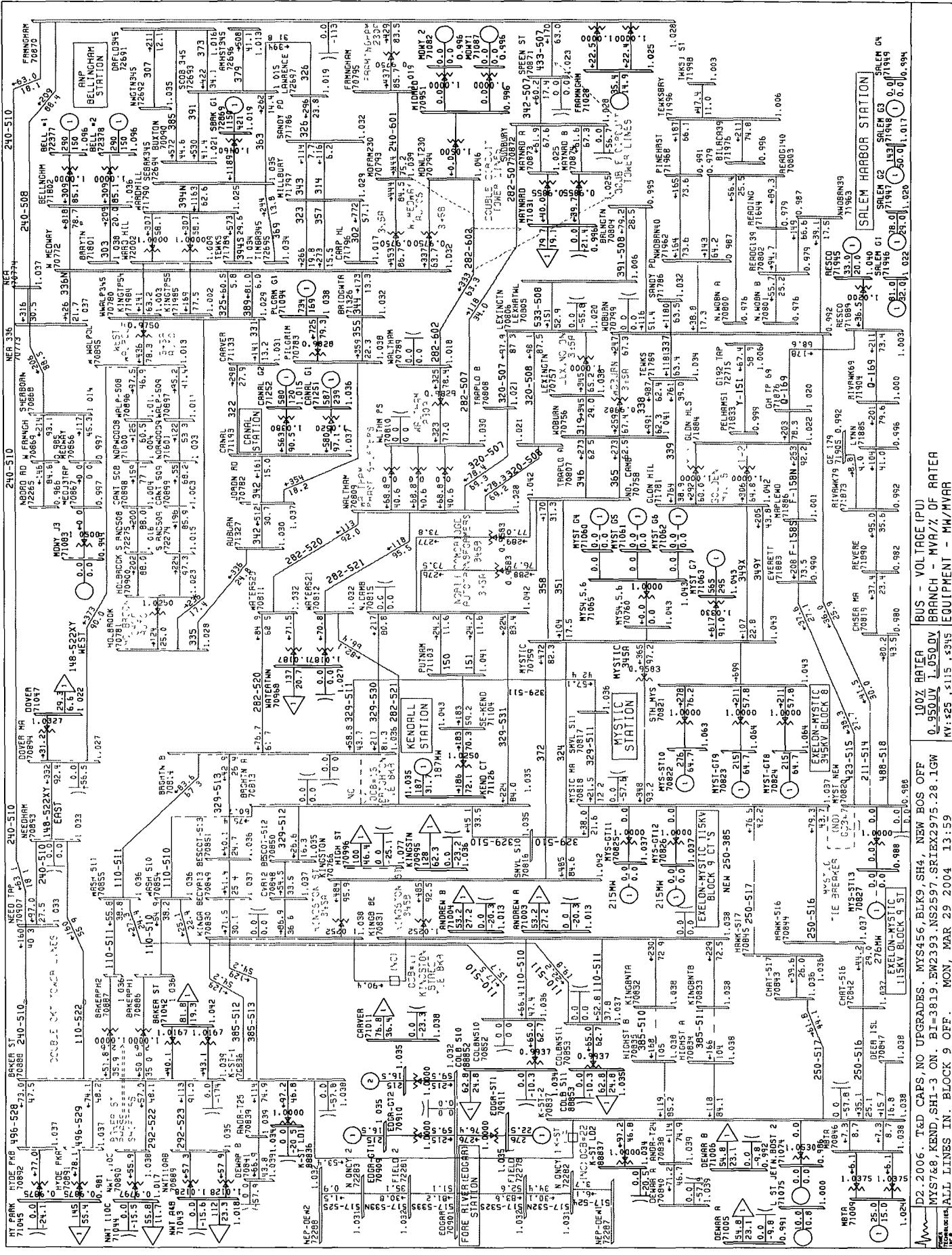
**APPENDIX F-2. CONTINGENCY LOADFLOW DIAGRAMS – BLOCK 9 OFF,  
NEW BOSTON ON**

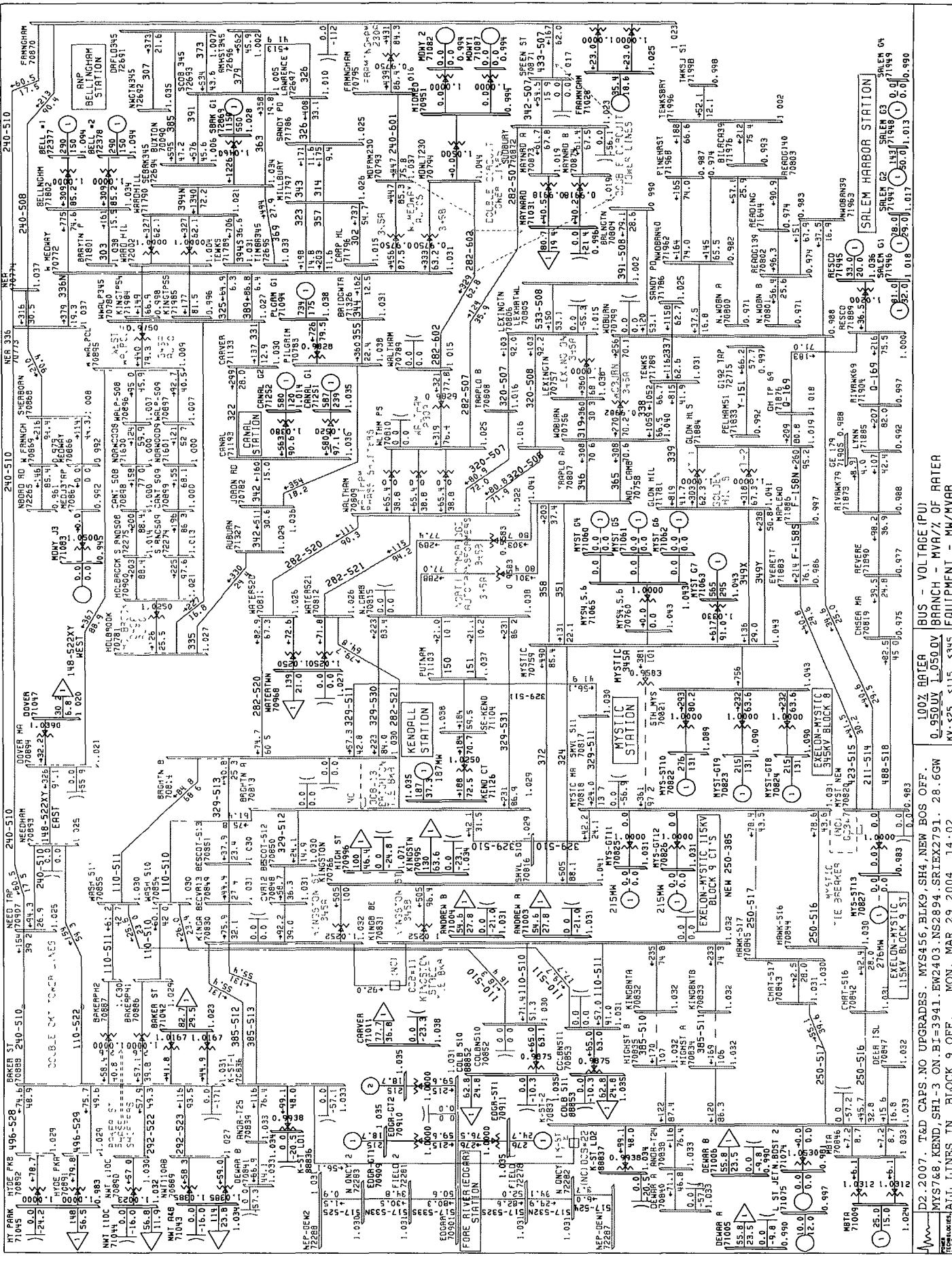
| Figure | Contingency                                                                                                                                                                                                                                                                                                                                                                                                                 | Overloaded Element (s)                                                                                                                         | Voltage Violations                                                                                                                                                                             |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F-2A   | Mystic-Kingston Street<br>345kV Cable 372                                                                                                                                                                                                                                                                                                                                                                                   | Mystic-Kingston Street<br>Parallel 345kV Cable 324                                                                                             | None                                                                                                                                                                                           |
| F-2B   | Kingston St 345A<br>Autotransformer                                                                                                                                                                                                                                                                                                                                                                                         | Kingston St 345B Autotransformer<br>Mystic 345A Autotransformer                                                                                | None                                                                                                                                                                                           |
| F-2C   | Lines 282-602+433-507<br>Double-Circuit Tower<br><br>(This Contingency Will Be<br>Eliminated In 2004 By Moving<br>the Lines to Separate Towers.)                                                                                                                                                                                                                                                                            | 115kV Cables 282-520 & 282-520<br>(Brighton-Watertown)<br><br>282-520 (Watertown-Waltham)<br><br>320-507 & 320-508<br>(Lexington-Trapelo Road) | Loss of 433-507 Places Speen Street,<br>Maynard, Sudbury on a Radial Feed<br>From Waltham.<br><br>Low Voltages (0.96-0.97pu)<br>Experienced In These Areas.                                    |
| F-2D   | 115kV Cable 329-530<br>(North Cambridge-Brighton)                                                                                                                                                                                                                                                                                                                                                                           | Parallel 115kV Cable 329-531<br>(North Cambridge-Brighton)                                                                                     | None                                                                                                                                                                                           |
| F-2E   | Lines 110-522+240-510<br>Double-Circuit Tower                                                                                                                                                                                                                                                                                                                                                                               | 115kV Baker St Phase Shifters 1 & 2<br><br>115kV Cables 110-510 & 110-511<br>(Washington Tap – Baker Street)                                   | None                                                                                                                                                                                           |
|        | This DCT contingency places Hyde Park, Baker Street, and Newton on a radial feed through the two Baker Street Phase Shifters and the 110-510 & 110-511 Cables (Washington Tap-Baker Street) That Supply Them. Hence, There Is No Way To Eliminate This Overload Through Phase Shifter Adjustment. The 345kV reinforcements, however, will eliminate all of the violations that occur during this DCT outage.                |                                                                                                                                                |                                                                                                                                                                                                |
| F-2F   | West Walpole 345A<br>Autotransformer (2004)                                                                                                                                                                                                                                                                                                                                                                                 | 115kV Lines 447-508 & 447-509<br>(Canton – Norwood)                                                                                            | 115kV voltages along Lines 447-508 &<br>447-509 drop from 1.02 at Holbrook to<br>0.98 at West Walpole. Dover at 1.00pu;<br>Sherborn at 0.99; W. Framingham at<br>0.97; Northboro Road at 0.95. |
| F-2G   | West Walpole 345A<br>Autotransformer (2006)                                                                                                                                                                                                                                                                                                                                                                                 | 115kV Lines 447-508 & 447-509<br>(Canton – Norwood)<br><br>115kV Lines 447-508 & 447-509<br>(Holbrook-South Randolph)                          |                                                                                                                                                                                                |
|        | Loss of the West Walpole 345A Autotransformer places Lines 447-508 & 447-509 on a radial feed from the Holbrook Autotransformer. The Holbrook Auto is loaded to only 43% of its LTE rating, however. Lines closest to Holbrook carry the heaviest load because they have to supply the five 115kV step-down stations between Holbrook and West Walpole. Load drops off with each line section that gets closer to Holbrook. |                                                                                                                                                |                                                                                                                                                                                                |

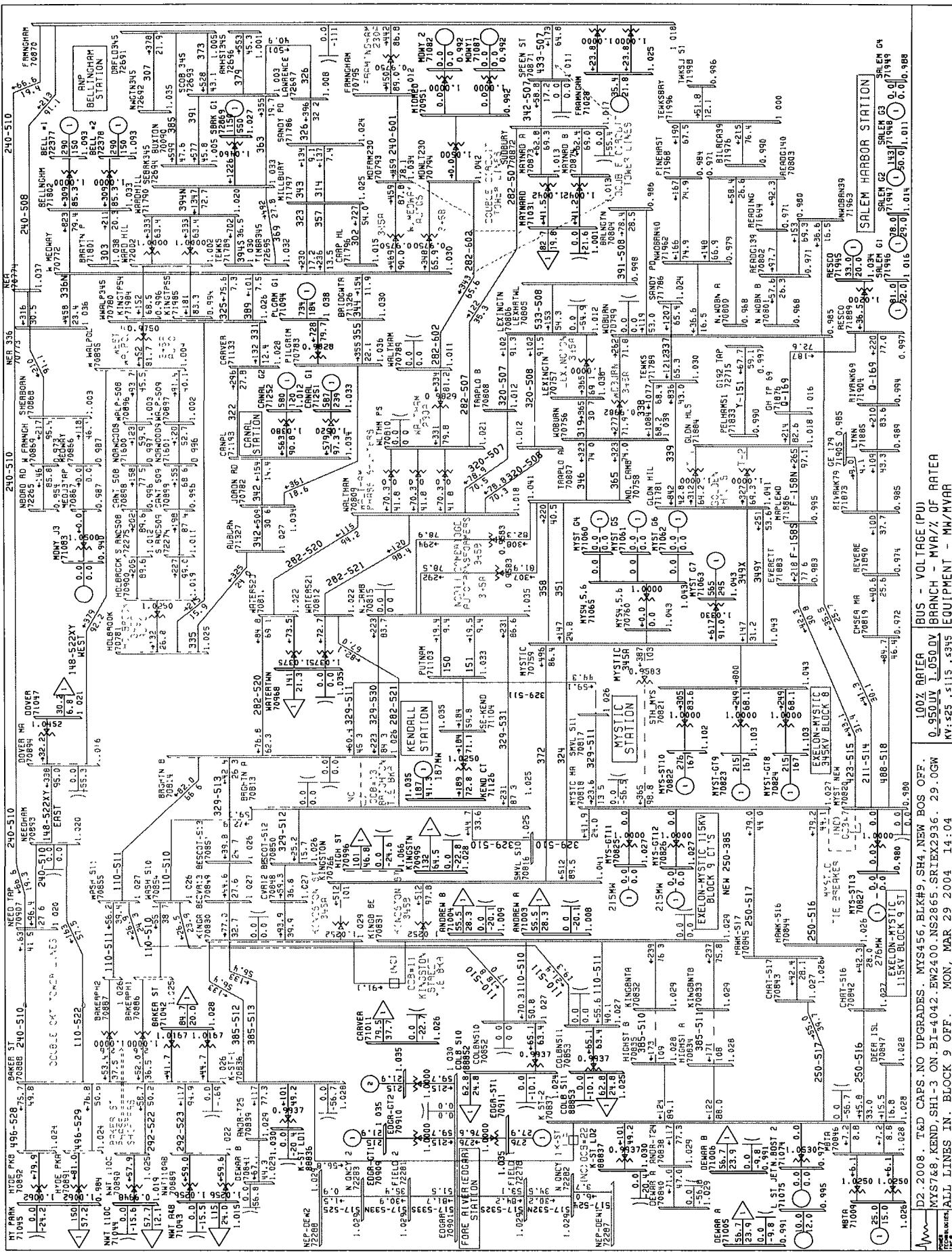
**APPENDIX E-1. ALL-LINES-IN**  
**LOADFLOW DIAGRAMS – BLOCK 9 OFF**











**APPENDIX E-2. ALL-LINES-IN**  
**LOADFLOW DIAGRAMS – BLOCK 9 OFF,**  
**NEW BOSTON ON.**

